high surface area mixed conductive electrodes (100 to 1,000 M^2/g) seen in FIG. 7, fast CO reaction kinetics at the interface are achieved and strong signal response is obtained.

While the inventive gas sensor can be used to measure CO concentration, it is also capable of measuring other gases such as H_2, H_2S, H_2O vapor alcohol, and NO_x concentrations.

Various protonic conductors, including organic protonic conductors and inorganic protonic conductors, can be used in the sensor according to this invention. In what follows, a copolymer protonic conductive membrane based on a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing sulfonic acid group is used herein as an example of the fabrication of the inventive sensor.

To prevent deterioration of the polymer membrane in the subsequent wetting/drying steps, the membrane must be first converted from the proton form to the sodium form by the following steps A:

A. The polymer membrane is soaked in lightly boiling dilute NaOH solution for 1–3 hours. It is then rinsed first in tap water for 0.5–3 hours, then in deionized water for 10–30 minutes, and is then laid out on a rack to air dry.

B. The materials for the preferred mixed conduction electrodes are as follows: Pt/carbon powder, carbon powder, Ru oxide powder, solubilized polymer solution, Glycerol, NaOH solution, and deionized water.

C. The steps for fabrication are as follows:

1. Pre-mix deionized water and glycerol in 20–30% weight ratio, and store the mixture in a container;
2. Weigh an appropriate amount of Pt/carbon powder into a clean container;
3. Weigh an appropriate amount of 5% wt polymer solution, and add to material in step C.2, and then mix. Typically, add 1–3 parts 5% wt NAFION™ solution (on a dry polymer basis) to 3–5 parts Pt/carbon powder;
4. Weigh and add an appropriate amount of water/glycerol mixture to mixture in step C.3, and then mix. Typically, add 25–35 parts water/glycerol mixture to one part Pt/carbon powder;
5. Weigh and add an appropriate amount of 1–2 Moles NaOH to the mixture in step C.4, and then mix. Typically, add 1–2 parts 1–2 Moles NaOH to 9–15 parts 5% wt polymer solution; and further mix the wet electrode mixture ultrasonically for 60 minutes.

For Carbon/Ru Oxide electrode preparation, the following steps are taken:

1. Pre-mix the deionized water and glycerol in 20–30% weight ratio, store the mixture in a container, and set aside;
2. Weigh an appropriate amount of carbon powder and Ru oxide into a clean container;
3. Weigh an appropriate amount of 5% wt polymer solution, and add to the material in step D.2, and then mix. Typically, add 1–3 parts 5% wt polymer solution (on a dry polymer basis) to 3–5 parts carbon/Ru oxide powder;
4. Weigh and add an appropriate amount of water/glycerol mixture to mixture in step D.3, and then mix. Typically, add 25–35 parts water/glycerol mixture to 1 part carbon/Ru oxide powder;
5. Weigh and add an appropriate amount of 1–2 Moles NaOH to the mixture in step C.4, and then mix. Typically, add 1 part 1–2 Moles NaOH to 9–15 parts 5% wt polymer solution; and further mix the wet electrode mixture ultrasonically for 60 minutes.

E. For Pt/Carbon Electrode application drying, the following steps are taken:

1. Re-mix the wet electrode mixture ultrasonically for at least 30 minutes prior to use;
2. Fill the dispensing machine tubing with the Pt/carbon wet electrode mixture;
3. Dispense the wet electrode mixture to the surface of the membrane at the desired location; and
4. Place the membrane/electrode in an oven at 100°–170° C. for 10–60 minutes.

F. For Carbon/Ru Oxide Electrode application drying, the following steps are taken:

Repeat step A on the opposite side of the membrane.

G. For acidification, the following steps are taken:

1. For Ion-Exchange, soak membrane/electrodes in lightly boiling dilute MH2S04 solution for 1–3 hours.
2. For cleaning, rinse the membrane/electrodes in deionized water;
3. For drying, dry the membrane/electrodes in air, or air dry then desiccate overnight, or place in a 30°–50° C. oven for 1–3 hours before cutting to the final dimensions.

The present invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrated and not restrictive. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

What is claimed and desired to be secured by United States Letters Patent is:

1. An electrochemical gas sensor for quantitative measurement of a gas in a ambient atmosphere comprising:

a sensing electrode permeable to water vapor and comprised of an electrical conducting material and having a surface exposed to the ambient atmosphere;

a counter electrode permeable to water vapor and comprised of an electrical conducting material;

a first protonic conductive electrolyte membrane permeable to water vapor and situated between and in contact with the sensing and counter electrodes, the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode;

means for electrical measurement electrically connected to said sensing and counter electrodes;

means, containing a volume of water vapor, for exposing a surface of said counter electrode to said water vapor, wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10–50 wt % of a proton conductor material and 50–90 wt % of a first and a second electrical conductor material; whereby, in a positive ambient atmosphere concentration of said gas, said electrical measurement means detects changes in said electrical characteristic.

2. The electrochemical gas sensor as defined in claim 1, wherein said water vapor containing means contains a volume of water and an antifreeze additive.

3. The electrochemical gas sensor as defined in claim 1, wherein the surface of said sensing electrode that is exposed

to the ambient atmosphere has a surface area that is smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode exposed to said water vapor to the surface of said sensing electrode exposed to the ambient atmosphere.

4. The electrochemical gas sensor as defined in claim **3**, wherein the surface area of the surface of the counter electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water.

5. The electrochemical gas sensor as defined in claim **1**, wherein the first protonic conductive electrolyte membrane has opposing surfaces, each of said opposing surfaces being in contact with one of the sensing and counter electrodes, wherein at least one of the opposing surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar.

6. The electrochemical gas sensor as defined in claim **1**, wherein at least one of the sensing and counter electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms.

7. The electrochemical gas sensor as defined in claim **6**, wherein the film is substantially composed of a noble metal.

8. The electrochemical gas sensor as defined in claim **7**, wherein the noble metal is platinum.

9. The electrochemical gas sensor as defined in claim **1**, wherein the first protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer.

10. The electrochemical gas sensor as defined in claim **1**, wherein the first protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane.

11. The electrochemical gas sensor as defined in claim **1**, wherein the proton conductor material for said at least one of the sensing and counter electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group.

12. The electrochemical gas sensor as defined in claim **1**, wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50–99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1–50 wt % of platinum.

13. The electrochemical gas sensor as defined in claim **1**, wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50–99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1–50 wt % of Ru oxide.

14. The electrochemical gas sensor as defined in claim **1**, wherein the electrochemical gas sensor further comprises:

first and second pump electrodes comprised of an electrical conducting material permeable to water vapor, separate from said sensing and counter electrodes, and situated on opposite sides of and in contact with said first protonic conductive electrolyte membrane, said second pump electrode being situated on the same side of said first protonic conductive membrane as the counter electrode and having a surface thereon exposed to the water vapor in said means for exposing a surface of said counter electrode to said water vapor; and

means for applying a DC power across the first protonic conductive electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the first protonic conductive electrolyte membrane;

whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes.

15. The electrochemical gas sensor of claim **14**, wherein the electrical conducting material of the first and second pump electrodes is substantially composed of carbon.

16. The electrochemical gas sensor as defined in claim **14**, wherein the electrical conducting material of the first and second pump electrodes is substantially composed of noble metals.

17. The electrochemical gas sensor as defined in claim **14**, wherein the electrical conducting material of the first and second pump electrodes is substantially composed of conductive hydrated metal oxides.

18. The electrochemical gas sensor as defined in claim **14**, wherein at least one of the first and second pump electrodes is comprised of a film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms.

19. The electrochemical gas sensor as defined in claim **14**, wherein the electrical conducting material of said first and second pump electrodes is a proton-electron mixed conductive material having 10–50 wt % of a proton conductor material and 50–90 wt % of a first and a second electrical conductor material.

20. The electrochemical gas sensor as defined in claim **19**, wherein the proton conductor material for both the first and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group.

21. The electrochemical gas sensor as defined in claim **19**, wherein one of the first and second electrical conductor materials for the first pump electrode is about 50–99 wt % of carbon black, and the other of the first and second electrical conductor materials for the first pump electrode is 1 to 50 wt % of platinum.

22. The electrochemical gas sensor as defined in claim **19**, wherein one of the first and second electrical conductor materials for the second pump electrode is about 50–99 wt % of carbon black, and the other of the first and second electrical conductor materials for the second pump electrode is 1 to 50 wt % of Ru oxide.

23. The electrochemical gas sensor as defined in claim **1**, wherein the electrochemical gas sensor further comprises:

a second protonic conductive electrolyte membrane permeable to water vapor;

first and second pump electrodes permeable to water vapor and comprised of an electron conductive material, and being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane, said means for exposing a surface of said counter electrode to said water vapor exposing a surface of said second pump electrode to said water vapor, and said first pump electrode having a surface exposed to the ambient atmosphere; and

means for applying a DC power across said second protonic electrolyte membrane, said first and second

pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane;

whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes.

24. The electrochemical gas sensor as defined in claim 23, wherein the second protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer.

25. The electrochemical gas sensor as defined in claim 23, wherein the second protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane.

26. The electrochemical gas sensor as defined in claim 23, wherein the surface area of the surface of said first pump electrode that is exposed to the ambient atmosphere is smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, whereby the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere.

27. The electrochemical gas sensor as defined in claim 26, wherein the surface area of the surface of the second pump electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water.

28. The electrochemical gas sensor as defined in claim 1, further comprising:

means for applying a DC pulse power source across the first protonic conductive membrane, said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the first protonic conductive membrane; and

switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the DC pulse power means;

whereby, in a positive ambient atmosphere concentration of said gas, said electrical measurement means detects changes in said electrical characteristic when said switch means connects said electrical measurement means to the sensing and counter electrodes; and

whereby said DC pulse power means moves the gas away from a side of the gas sensor where the counter electrode is placed when said switch means connects said DC pulse power means to the sensing and counter electrodes.

29. The electrochemical gas sensor as defined in claim 1, wherein the gas is CO.

30. The electrochemical gas sensor as defined in claim 1, wherein the gas is NO_x.

31. The electrochemical gas sensor as defined in claim 1, wherein the gas is hydrogen.

32. The electrochemical gas sensor as defined in claim 1, wherein the gas is H_2S.

33. The electrochemical gas sensor as defined in claim 1, wherein the gas is H_2O vapor.

34. The electrochemical gas sensor as defined in claim 1, wherein the gas is alcohol vapor.

35. An electrochemical gas sensor for quantitative measurement of a gas in an ambient atmosphere comprising:

a sensing electrode permeable to water vapor and comprised of an electrical conducting material and having a surface exposed to the ambient atmosphere;

a counter electrode permeable to water vapor and comprised of an electrical conducting material;

a first protonic conductive electrolyte membrane permeable to water vapor and situated in between and in contact with the sensing and counter electrodes, the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode;

a second protonic conductive electrolyte membrane permeable to water vapor;

first and second pump electrodes permeable to water vapor and comprised of an electrical conductive material, and being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane;

means, containing a volume of water vapor, for exposing a surface of said second pump electrode to said water vapor, and said first pump electrode having a surface exposed to the ambient atmosphere, said second pump electrode being separated from said counter electrode by said means for exposing a surface of said second pump electrode to said water vapor, and said counter electrode having a surface exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor;

means for electrical measurement in electrical communication with said sensing electrode and said counter electrode; and

means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first and second pump electrodes;

whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said second protonic electrolyte membrane; and

whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic.

36. The electrochemical gas sensor as defined in claim 35, wherein at least one of said first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer.

37. The electrochemical gas sensor as defined in claim 35, wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductor electrolyte membrane.

38. The electrochemical gas sensor as defined in claim 35, wherein the surface of said first pump electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, and wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere, the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and

a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere.

39. The electrochemical gas sensor as defined in claim 38, wherein the surface area of each of the surfaces of the second pump and counter electrodes that are exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor are each separated from said means for exposing a surface of said second pump electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water.

40. The electrochemical gas sensor as defined in claim 35, wherein said means for exposing a surface of said second pump electrode to said water vapor further contains an antifreeze additive.

41. The electrochemical gas sensor as defined in claim 35, wherein at least one of the surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar, and wherein at least one of the surfaces of said second protonic conductive electrolyte membrane in contact with one of the first and second pump electrodes is substantially nonplanar.

42. The electrochemical gas sensor as defined in claim 35, wherein at least one of the sensing, counter, first pump, and second pump electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms.

43. The electrochemical gas sensor as defined in claim 42, wherein the film is substantially composed of a noble metal.

44. The electrochemical gas sensor as defined in claim 43, wherein the noble metal is platinum.

45. The electrochemical gas sensor as defined in claim 35, wherein the at least one of the sensing, counter, first pump, and second pump electrodes is substantially comprised of proton conductive material.

46. The electrochemical gas sensor as defined in claim 35, wherein at least one of the first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer.

47. The electrochemical gas sensor as defined in claim 35, wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductive electrolyte membrane.

48. The electrochemical gas sensor as defined in claim 35, wherein the electrical conducting material of at least one of said sensing, counter, first pump, and second pump electrodes is a proton-electron mixed conductive material having 10–50 wt % of a proton conductor material and 50–90 wt % of a first and a second electrical conductor material.

49. The electrochemical gas sensor as defined in claim 48, wherein the proton conductor material for said at least one of the sensing, counter, first pump, and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group.

50. The electrochemical gas sensor as defined in claim 48, wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50–99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump and second pump electrodes is about 1–50 wt % of platinum.

51. The electrochemical gas sensor as defined in claim 48, wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50–99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1–50 wt % of Ru oxide.

52. An electrochemical gas sensor for quantitative measurement of a gas in an ambient atmosphere comprising:

a sensing electrode permeable to water vapor and comprised of an electrical conducting material and being exposed to the ambient atmosphere;

a reference electrode permeable to water vapor and comprised of an electrical conducting material;

a counter electrode permeable to water vapor and comprised of an electrical conducting material and being separate from both said sensing and reference electrodes, and being exposed to the ambient atmosphere;

a protonic conductive electrolyte membrane permeable to water vapor, having top and bottom sides, said bottom side of said protonic conductive membrane being in contact with the counter electrode, and the top side of said protonic conductive membrane being in contact with the sensing and reference electrodes;

means, containing a volume of water vapor, for exposing a surface of said counter electrode to said water vapor, the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode; and

means for electrical measurement in electrical contact between the sensing electrode and the counter electrode, wherein the electrical conducting material of at least one of said sensing, counter, and reference electrodes is a proton-electron mixed conductive material having 10–50 wt % of a proton conductor material and 50–90 wt % of a first and a second electrical conductor material;

whereby, in a positive ambient concentration of said gas, said electrical measurement means detects changes in said electrical characteristic.

53. The electrochemical gas sensor as defined in claim 52, further comprising:

means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said counter electrode, whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said protonic electrolyte membrane.

54. The electrochemical gas sensor as defined in claim 52, wherein said means for exposing a surface of said counter electrode to said water vapor further contains an antifreeze additive.

55. The electrochemical gas sensor as defined in claim 52, wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere.

56. The electrochemical gas sensor as defined in claim 55, wherein the surface area of the surface of the counter electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter

electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water.

57. The electrochemical gas sensor as defined in claim 52, wherein at least one of the surfaces of said protonic conductive electrolyte membrane in contact with one of the sensing, counter, and reference electrodes is substantially nonplanar.

58. The electrochemical gas sensor as defined in claim 52, wherein at least one of the sensing, counter, and reference electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms.

59. The electrochemical gas sensor as defined in claim 58, wherein the film is substantially composed of a noble metal.

60. The electrochemical gas sensor as defined in claim 59, wherein the noble metal is platinum.

61. The electrochemical gas sensor as defined in claim 52, wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer.

62. The electrochemical gas sensor as defined in claim 52, wherein the protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane.

63. The electrochemical gas sensor as defined in claim 52, wherein the proton conductor material for said at least one of the sensing, counter, and reference electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group.

64. The electrochemical gas sensor as defined in claim 52, wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50–99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1–50 wt % of platinum.

65. The electrochemical gas sensor as defined in claim 52, wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50–99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1–50 wt % of Ru oxide.

* * * * *

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
1	66	Unlike original patent claim 1, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane."
2	66	Unlike original patent claim 2, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 2, presented reissue claim 66 does not recite the language "wherein said water vapor containing means contains a volume of water and an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
9	66	Unlike original patent claim 9, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 9, presented reissue claim 66 does not recite the language "wherein the first protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."
10	66	Unlike original patent claim 10, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 10, presented reissue claim 66 does not recite the language "wherein the first protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
13	66	Unlike original patent claim 13, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 13, presented reissue claim 66 does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of Ru oxide."
14	66	Unlike original patent claim 14, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 14, presented reissue claim 66 does not recite the language "wherein the electrochemical gas sensor further comprises: first and second pump electrodes comprised of an electrical conducting material permeable to water vapor, separate from said sensing and counter electrodes, and situated on opposite sides of and in contact with said first protonic conductive electrolyte membrane, said second pump electrode being situated on the same side of said first protonic conductive membrane as the counter electrode and having a surface thereon exposed to the water vapor in said means for exposing a surface of said counter electrode to said water vapor; and means for applying a DC power across the first protonic conductive electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the first protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
15	66	Unlike original patent claim 15, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 15, presented reissue claim 66 does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of carbon."
16	66	Unlike original patent claim 16, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 16, presented reissue claim 66 does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
17	66	Unlike original patent claim 17, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 17, presented reissue claim 66 does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of conductive hydrated metal oxides."
18	66	Unlike original patent claim 18, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 18, presented reissue claim 66 does not recite the language "wherein at least one of the first and second pump electrodes is comprised of a film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
19	66	Unlike original patent claim 19, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 19, presented reissue claim 66 does not recite the language "wherein the electrical conducting material of said first and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."
20	66	Unlike original patent claim 20, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 20, presented reissue claim 66 does not recite the language "wherein the proton conductor material for both the first and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
21	66	Unlike original patent claim 21, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 21, presented reissue claim 66 does not recite the language "wherein one of the first and second electrical conductor materials for the first pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the first pump electrode is 1 to 50 wt % of platinum."
22	66	Unlike original patent claim 22, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 22, presented reissue claim 66 does not recite the language "wherein one of the first and second electrical conductor materials for the second pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the second pump electrode is 1 to 50 wt % of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
23	66	Unlike original patent claim 23, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 23, presented reissue claim 66 does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane permeable to water vapor; first and second pump electrodes permeable to water vapor and comprised of an electron conductive material, and being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane, said means for exposing a surface of said counter electrode to said water vapor exposing a surface of said second pump electrode to said water vapor, and said first pump electrode having a surface exposed to the ambient atmosphere; and means for applying a DC power across said second protonic electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."
24	66	Unlike original patent claim 24, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 24, presented reissue claim 66 does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
25	66	Unlike original patent claim 25, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 25, presented reissue claim 66 does not recite the language "wherein the second protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."
26	66	Unlike original patent claim 26, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 26, presented reissue claim 66 does not recite the language "wherein the surface area of the surface of said first pump electrode that is exposed to the ambient atmosphere is smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, whereby the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
27	66	Unlike original patent claim 27, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 27, presented reissue claim 66 does not recite the language "wherein the surface area of the surface of the second pump electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
28	66	Unlike original patent claim 28, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 28, presented reissue claim 66 does not recite the language "further comprising: means for applying a DC pulse power source across the first protonic conductive membrane, said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the first protonic conductive membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the DC pulse power means; whereby, in a positive ambient atmosphere concentration of said gas, said electrical measurement means detects changes in said electrical characteristic when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said DC pulse power means moves the gas away from a side of the gas sensor where the counter electrode is placed when said switch means connects said DC pulse power means to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
29	66	Unlike original patent claim 29, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 29, presented reissue claim 66 does not recite the language "wherein the gas is CO."
30	66	Unlike original patent claim 30, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 30, presented reissue claim 66 does not recite the language "wherein the gas is NO_x."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
31	66	Unlike original patent claim 31, presented reissue claim 66 recites the language “a two-electrode electrochemical gas sensor” and also recites the language “the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane.” Unlike original patent claim 31, presented reissue claim 66 does not recite the language “wherein the gas is hydrogen.”
32	66	Unlike original patent claim 32, presented reissue claim 66 recites the language “a two-electrode electrochemical gas sensor” and also recites the language “the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane.” Unlike original patent claim 32, presented reissue claim 66 does not recite the language “wherein the gas is H_2S.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
33	66	Unlike original patent claim 33, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 33, presented reissue claim 66 does not recite the language "wherein the gas is H_2O vapor."
34	66	Unlike original patent claim 34, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 34, presented reissue claim 66 does not recite the language "wherein the gas is alcohol vapor."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
35	66	Unlike original patent claim 35, presented reissue claim 66 recites the language “a two-electrode electrochemical gas sensor,” recites the language “the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane,” and also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.” Unlike original patent claim 35, presented reissue claim 66 does not recite the language “a second protonic conductive electrolyte membrane permeable to water vapor;” does not recite the language “and said first pump electrode having a surface exposed to the ambient atmosphere, said second pump electrode being separated from said counter electrode by said means for exposing a surface of said second pump electrode to said water vapor, and said counter electrode having a surface exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor,” and also does not recite the language “means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first and second pump electrodes; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said second protonic electrolyte membrane.”
36	66	Unlike original patent claim 36, presented reissue claim 66 recites the language “a two-electrode electrochemical gas sensor,” recites the language “the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane,” and also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.” Unlike original patent claim 36, presented reissue claim 66 does not recite the language “wherein at least one of said first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
37	66	Unlike original patent claim 37, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 37, presented reissue claim 66 does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductor electrolyte membrane."
38	66	Unlike original patent claim 38, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 38, presented reissue claim 66 does not recite the language "wherein the surface of said first pump electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, and wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere, the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
39	66	Unlike original patent claim 39, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 39, presented reissue claim 66 does not recite the language "wherein the surface area of each of the surfaces of the second pump and counter electrodes that are exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor are each separated from said means for exposing a surface of said second pump electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
40	66	Unlike original patent claim 40, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 40, presented reissue claim 66 does not recite the language "wherein said means for exposing a surface of said second pump electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
41	66	Unlike original patent claim 41, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 41, presented reissue claim 66 does not recite the language "wherein at least one of the surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar, and wherein at least one of the surfaces of said second protonic conductive electrolyte membrane in contact with one of the first and second pump electrodes is substantially nonplanar."
42	66	Unlike original patent claim 42, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 42, presented reissue claim 66 does not recite the language "wherein at least one of the sensing, counter, first pump, and second pump electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
43	66	Unlike original patent claim 43, presented reissue claim 66 recites the language “a two-electrode electrochemical gas sensor,” recites the language “the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane,” and also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.” Unlike original patent claim 43, presented reissue claim 66 does not recite the language “wherein the film is substantially composed of a noble metal.”
44	66	Unlike original patent claim 44, presented reissue claim 66 recites the language “a two-electrode electrochemical gas sensor,” recites the language “the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane,” and also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.” Unlike original patent claim 44, presented reissue claim 66 does not recite the language “wherein the noble metal is platinum.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
45	66	Unlike original patent claim 45, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 45, presented reissue claim 66 does not recite the language "wherein the at least one of the sensing, counter, first pump, and second pump electrodes is substantially comprised of proton conductive material."
46	66	Unlike original patent claim 46, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 46, presented reissue claim 66 does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is substantially comprised of a *solid, perfluorinated, ion-exchange* polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
47	66	Unlike original patent claim 47, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 47, presented reissue claim 66 does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductive electrolyte membrane."
48	66	Unlike original patent claim 48, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 48, presented reissue claim 66 does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, first pump, and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
49	66	Unlike original patent claim 49, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 49, presented reissue claim 66 does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, first pump, and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
50	66	Unlike original patent claim 50, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 50, presented reissue claim 66 does not recite the language wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump and second pump electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
51	66	Unlike original patent claim 51, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 51, presented reissue claim 66 does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
52	66	Unlike original patent claim 52, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 52, presented reissue claim 66 does not recite the language "a reference electrode permeable to water vapor and comprised of an electrical conducting material; a counter electrode permeable to water vapor and comprised of an electrical conducting material and being separate from both said sensing and reference electrodes, and being exposed to the ambient atmosphere; a protonic conductive electrolyte membrane permeable to water vapor, having top and bottom sides, said bottom side of said protonic conductive membrane being in contact with the counter electrode, and the top side of said protonic conductive membrane being in contact with the sensing and reference electrodes;" and also does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, and reference electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
53	66	Unlike original patent claim 53, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 53, presented reissue claim 66 does not recite the language "further comprising: means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said counter electrode, whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said protonic electrolyte membrane."
54	66	Unlike original patent claim 54, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 54, presented reissue claim 66 does not recite the language "wherein said means for exposing a surface of said counter electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
55	66	Unlike original patent claim 55, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 55, presented reissue claim 66 does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere."
56	66	Unlike original patent claim 56, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 56, presented reissue claim 66 does not recite the language "wherein at least one of the surfaces of said protonic conductive electrolyte membrane in contact with one of the sensing, counter, and reference electrodes is substantially nonplanar."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
57	66	Unlike original patent claim 57, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 57, presented reissue claim 66 does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical *conductor materials for said at least one of the sensing*, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
58	66	Unlike original patent claim 58, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 58, presented reissue claim 66 does not recite the language "wherein at least one of the sensing, counter, and *reference electrodes is comprised of* film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
59	66	Unlike original patent claim 59, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 59, presented reissue claim 66 does not recite the language "wherein the film is substantially composed of a noble metal."
60	66	Unlike original patent claim 60, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 60, presented reissue claim 66 does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
61	66	Unlike original patent claim 61, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 61, presented reissue claim 66 does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."
62	66	Unlike original patent claim 62, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 62, presented reissue claim 66 does not recite the language "wherein the protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
63	66	Unlike original patent claim 63, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 63, presented reissue claim 66 does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, and reference electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
64	66	Unlike original patent claim 64, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 64, presented reissue claim 66 does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
65	66	Unlike original patent claim 65, presented reissue claim 66 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 65, presented reissue claim 66 does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
1	67	Unlike original patent claim 1, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode."
2	67	Unlike original patent claim 2, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 2, presented reissue claim 67 does not recite the language "wherein said water vapor containing means contains a volume of water and an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
3	67	Unlike original patent claim 3, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 3, presented reissue claim 67 does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area that is smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to *substantially 100 percent relative humidity*, and *a positive pressure* of said water vapor exists from the surface of said counter electrode exposed to said water vapor to the surface of said sensing electrode exposed to the ambient atmosphere."
4	67	Unlike original patent claim 4, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 4, presented reissue claim 67 does not recite the language "wherein the surface area of the surface of *the counter electrode that is exposed to said water* vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
5	67	Unlike original patent claim 5, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 5, presented reissue claim 67 does not recite the language "wherein the first protonic conductive electrolyte membrane has opposing surfaces, each of said opposing surfaces being in contact with one of the sensing and counter electrodes, wherein at least one of the opposing surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar."
6	67	Unlike original patent claim 6, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 6, presented reissue claim 67 does not recite the language "wherein at least one of the sensing and counter electrodes is comprised of film having a *thickness in the range of about 50 Angstroms to 10,000 Angstroms.*"

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
7	67	Unlike original patent claim 7, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 7, presented reissue claim 67 does not recite the language "wherein the film is substantially composed of a noble metal."
8	67	Unlike original patent claim 8, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 8, presented reissue claim 67 does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
9	67	Unlike original patent claim 9, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 9, presented reissue claim 67 does not recite the language "wherein the first protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."
10	67	Unlike original patent claim 10, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 10, presented reissue claim 67 does not recite the language "wherein the first protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
11	67	Unlike original patent claim 11, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 11, presented reissue claim 67 does not recite the language "wherein the proton conductor material for said at least one of the sensing and counter electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
12	67	Unlike original patent claim 12, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 12, presented reissue claim 67 does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
13	67	Unlike original patent claim 13, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 13, presented reissue claim 67 does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of Ru oxide."
14	67	Unlike original patent claim 14, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 14, presented reissue claim 67 does not recite the language "wherein the electrochemical gas sensor further comprises: first and second pump electrodes comprised of an electrical conducting material permeable to water vapor, separate from said sensing and counter electrodes, and situated on opposite sides of and in contact with said first protonic conductive electrolyte membrane, said second pump electrode being situated on the same side of said first protonic conductive membrane as the counter electrode and having a surface thereon exposed to the water vapor in said means for exposing a surface of said counter electrode to said water vapor; and means for applying a DC power across the first protonic conductive electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the first protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
15	67	Unlike original patent claim 15, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 15, presented reissue claim 67 does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of carbon."
16	67	Unlike original patent claim 16, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 16, presented reissue claim 67 does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
17	67	Unlike original patent claim 17, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 17, presented reissue claim 67 does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of conductive hydrated metal oxides."
18	67	Unlike original patent claim 18, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 18, presented reissue claim 67 does not recite the language "wherein at least one of the first and second pump electrodes is comprised of a film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
19	67	Unlike original patent claim 19, presented reissue claim 67 recites the language “the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.” Unlike original patent claim 19, presented reissue claim 67 does not recite the language “wherein the electrical conducting material of said first and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.”
20	67	Unlike original patent claim 20, presented reissue claim 67 recites the language “the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.” Unlike original patent claim 20, presented reissue claim 67 does not recite the language “wherein the proton conductor material for both the first and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
21	67	Unlike original patent claim 21, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 21, presented reissue claim 67 does not recite the language "wherein one of the first and second electrical conductor materials for the first pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the first pump electrode is 1 to 50 wt % of platinum."
22	67	Unlike original patent claim 22, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 22, presented reissue claim 67 does not recite the language "wherein one of the first and second electrical conductor materials for the second pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the second pump electrode is 1 to 50 wt % of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
23	67	Unlike original patent claim 23, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 23, presented reissue claim 67 does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane permeable to water vapor; first and second pump electrodes permeable to water vapor and comprised of an electron conductive material, and being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane, said means for exposing a surface of said counter electrode to said water vapor exposing a surface of said second pump electrode to said water vapor, and said first pump electrode having a surface exposed to the ambient atmosphere; and means for applying a DC power across said second protonic electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."
24	67	Unlike original patent claim 24, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 24, presented reissue claim 67 does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
25	67	Unlike original patent claim 25, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 25, presented reissue claim 67 does not recite the language "wherein the second protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."
26	67	Unlike original patent claim 26, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 26, presented reissue claim 67 does not recite the language "wherein the surface area of the surface of said first pump electrode that is exposed to the ambient atmosphere is smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, whereby the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
27	67	Unlike original patent claim 27, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 27, presented reissue claim 67 does not recite the language "wherein the surface area of the surface of the second pump electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
28	67	Unlike original patent claim 28, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 28, presented reissue claim 67 does not recite the language "further comprising: means for applying a DC pulse power source across the first protonic conductive membrane, said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the first protonic conductive membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the DC pulse power means; whereby, in a positive ambient atmosphere concentration of said gas, said electrical measurement means detects changes in said electrical characteristic when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said DC pulse power means moves the gas away from a side of the gas sensor where the counter electrode is placed when said switch means connects said DC pulse power means to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
29	67	Unlike original patent claim 29, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 29, presented reissue claim 67 does not recite the language "wherein the gas is CO."
30	67	Unlike original patent claim 30, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 30, presented reissue claim 67 does not recite the language "wherein the gas is NO_x."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
31	67	Unlike original patent claim 31, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 31, presented reissue claim 67 does not recite the language "wherein the gas is hydrogen."
32	67	Unlike original patent claim 32, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 32, presented reissue claim 67 does not recite the language "wherein the gas is H_2S."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
33	67	Unlike original patent claim 33, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 33, presented reissue claim 67 does not recite the language "wherein the gas is H_2O vapor."
34	67	Unlike original patent claim 34, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 34, presented reissue claim 67 does not recite the language "wherein the gas is alcohol vapor."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
35	67	Unlike original patent claim 35, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 35, presented reissue claim 67 does not recite the language "a second protonic conductive electrolyte membrane permeable to water vapor;" does not recite the language "and said first pump electrode having a surface exposed to the ambient atmosphere, said second pump electrode being separated from said counter electrode by said means for exposing a surface of said second pump electrode to said water vapor, and said counter electrode having a surface exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor," and also does not recite the language "means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first and second pump electrodes; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said second protonic electrolyte membrane."
36	67	Unlike original patent claim 36, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 36, presented reissue claim 67 does not recite the language "wherein at least one of said first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
37	67	Unlike original patent claim 37, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 37, presented reissue claim 67 does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductor electrolyte membrane."
38	67	Unlike original patent claim 38, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 38, presented reissue claim 67 does not recite the language "wherein the surface of said first pump electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, and wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere, the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
39	67	Unlike original patent claim 39, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 39, presented reissue claim 67 does not recite the language "wherein the surface area of each of the surfaces of the second pump and counter electrodes that are exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor are each separated from said means for exposing a surface of said second pump electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
40	67	Unlike original patent claim 40, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 40, presented reissue claim 67 does not recite the language "wherein said means for exposing a surface of said second pump electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
41	67	Unlike original patent claim 41, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 41, presented reissue claim 67 does not recite the language "wherein at least one of the surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar, and wherein at least one of the surfaces of said second protonic conductive electrolyte membrane in contact with one of the first and second pump electrodes is substantially nonplanar."
42	67	Unlike original patent claim 42, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 42, presented reissue claim 67 does not recite the language "wherein at least one of the sensing, counter, first pump, and second pump electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
43	67	Unlike original patent claim 43, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 43, presented reissue claim 67 does not recite the language "wherein the film is substantially composed of a noble metal."
44	67	Unlike original patent claim 44, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 44, presented reissue claim 67 does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
45	67	Unlike original patent claim 45, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 45, presented reissue claim 67 does not recite the language "wherein the at least one of the sensing, counter, first pump, and second pump electrodes is substantially comprised of proton conductive material."
46	67	Unlike original patent claim 46, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 46, presented reissue claim 67 does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
47	67	Unlike original patent claim 47, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 47, presented reissue claim 67 does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductive electrolyte membrane."
48	67	Unlike original patent claim 48, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 48, presented reissue claim 67 does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, first pump, and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
49	67	Unlike original patent claim 49, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 49, presented reissue claim 67 does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, first pump, and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
50	67	Unlike original patent claim 50, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 50, presented reissue claim 67 does not recite the language wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump and second pump electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
51	67	Unlike original patent claim 51, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 51, presented reissue claim 67 does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
52	67	Unlike original patent claim 52, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 52, presented reissue claim 67 does not recite the language "a reference electrode permeable to water vapor and comprised of an electrical conducting material; a counter electrode permeable to water vapor and comprised of an electrical conducting material and being separate from both said sensing and reference electrodes, and being exposed to the ambient atmosphere; a protonic conductive electrolyte membrane permeable to water vapor, having top and bottom sides, said bottom side of said protonic conductive membrane being in contact with the counter electrode, and the top side of said protonic conductive membrane being in contact with the sensing and reference electrodes;" and also does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, and reference electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
53	67	Unlike original patent claim 53, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 53, presented reissue claim 67 does not recite the language "further comprising: means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said counter electrode, whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said protonic electrolyte membrane."
54	67	Unlike original patent claim 54, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 54, presented reissue claim 67 does not recite the language "wherein said means for exposing a surface of said counter electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
55	67	Unlike original patent claim 55, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 55, presented reissue claim 67 does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere."
56	67	Unlike original patent claim 56, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 56, presented reissue claim 67 does not recite the language "wherein at least one of the surfaces of said protonic conductive electrolyte membrane in contact with one of the sensing, counter, and reference electrodes is substantially nonplanar."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
57	67	Unlike original patent claim 57, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 57, presented reissue claim 67 does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
58	67	Unlike original patent claim 58, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 58, presented reissue claim 67 does not recite the language "wherein at least one of the sensing, counter, and reference electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
59	67	Unlike original patent claim 59, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 59, presented reissue claim 67 does not recite the language "wherein the film is substantially composed of a noble metal."
60	67	Unlike original patent claim 60, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 60, presented reissue claim 67 does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
61	67	Unlike original patent claim 61, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 61, presented reissue claim 67 does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."
62	67	Unlike original patent claim 62, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 62, presented reissue claim 67 does not recite the language "wherein the protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
63	67	Unlike original patent claim 63, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 63, presented reissue claim 67 does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, and reference electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
64	67	Unlike original patent claim 64, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 64, presented reissue claim 67 does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
65	67	Unlike original patent claim 65, presented reissue claim 67 recites the language "the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 65, presented reissue claim 67 does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
1	68	Unlike original patent claim 1, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode."
2	68	Unlike original patent claim 2, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 2, presented reissue claim 68 does not recite the language "wherein said water vapor containing means contains a volume of water and an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
3	68	Unlike original patent claim 3, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 3, presented reissue claim 68 does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area that is smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode exposed to said water vapor to the surface of said sensing electrode exposed to the ambient atmosphere."
4	68	Unlike original patent claim 4, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 4, presented reissue claim 68 does not recite the language "wherein the surface area of the surface of the counter electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
5	68	Unlike original patent claim 5, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 5, presented reissue claim 68 does not recite the language "wherein the first protonic conductive electrolyte membrane has opposing surfaces, each of said opposing surfaces being in contact with one of the sensing and counter electrodes, wherein at least one of the opposing surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar."
6	68	Unlike original patent claim 6, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 6, presented reissue claim 68 does not recite the language "wherein at least one of the sensing and counter electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
7	68	Unlike original patent claim 7, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 7, presented reissue claim 68 does not recite the language "wherein the film is substantially composed of a noble metal."
8	68	Unlike original patent claim 8, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 8, presented reissue claim 68 does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
9	68	Unlike original patent claim 9, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 9, presented reissue claim 68 does not recite the language "wherein the first protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."
10	68	Unlike original patent claim 10, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 10, presented reissue claim 68 does not recite the language "wherein the first protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
11	68	Unlike original patent claim 11, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 11, presented reissue claim 68 does not recite the language "wherein the proton conductor material for said at least one of the sensing and counter electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
12	68	Unlike original patent claim 12, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 12, presented reissue claim 68 does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
13	68	Unlike original patent claim 13, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 13, presented reissue claim 68 does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of Ru oxide."
14	68	Unlike original patent claim 14, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 14, presented reissue claim 68 does not recite the language "wherein the electrochemical gas sensor further comprises: first and second pump electrodes comprised of an electrical conducting material permeable to water vapor, separate from said sensing and counter electrodes, and situated on opposite sides of and in contact with said first protonic conductive electrolyte membrane, said second pump electrode being situated on the same side of said first protonic conductive membrane as the counter electrode and having a surface thereon exposed to the water vapor in said means for exposing a surface of said counter electrode to said water vapor; and means for applying a DC power across the first protonic conductive electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the first protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
15	68	Unlike original patent claim 15, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 15, presented reissue claim 68 does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of carbon."
16	68	Unlike original patent claim 16, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 16, presented reissue claim 68 does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
17	68	Unlike original patent claim 17, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 17, presented reissue claim 68 does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of conductive hydrated metal oxides."
18	68	Unlike original patent claim 18, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 18, presented reissue claim 68 does not recite the language "wherein at least one of the first and second pump electrodes is comprised of a film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
19	68	Unlike original patent claim 19, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 19, presented reissue claim 68 does not recite the language "wherein the electrical conducting material of said first and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."
20	68	Unlike original patent claim 20, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 20, presented reissue claim 68 does not recite the language "wherein the proton conductor material for both the first and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
21	68	Unlike original patent claim 21, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 21, presented reissue claim 68 does not recite the language "wherein one of the first and second electrical conductor materials for the first pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the first pump electrode is 1 to 50 wt % of platinum."
22	68	Unlike original patent claim 22, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 22, presented reissue claim 68 does not recite the language "wherein one of the first and second electrical conductor materials for the second pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the second pump electrode is 1 to 50 wt % of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
23	68	Unlike original patent claim 23, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 23, presented reissue claim 68 does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane permeable to water vapor; first and second pump electrodes permeable to water vapor and comprised of an electron conductive material, and being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane, said means for exposing a surface of said counter electrode to said water vapor exposing a surface of said second pump electrode to said water vapor, and said first pump electrode having a surface exposed to the ambient atmosphere; and means for applying a DC power across said second protonic electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."
24	68	Unlike original patent claim 24, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 24, presented reissue claim 68 does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
25	68	Unlike original patent claim 25, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 25, presented reissue claim 68 does not recite the language "wherein the second protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."
26	68	Unlike original patent claim 26, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 26, presented reissue claim 68 does not recite the language "wherein the surface area of the surface of said first pump electrode that is exposed to the ambient atmosphere is smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, whereby the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
27	68	Unlike original patent claim 27, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 27, presented reissue claim 68 does not recite the language "wherein the surface area of the surface of the second pump electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
28	68	Unlike original patent claim 28, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 28, presented reissue claim 68 does not recite the language "further comprising: means for applying a DC pulse power source across the first protonic conductive membrane, said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the first protonic conductive membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the DC pulse power means; whereby, in a positive ambient atmosphere concentration of said gas, said electrical measurement means detects changes in said electrical characteristic when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said DC pulse power means moves the gas away from a side of the gas sensor where the counter electrode is placed when said switch means connects said DC pulse power means to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
29	68	Unlike original patent claim 29, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 29, presented reissue claim 68 does not recite the language "wherein the gas is CO."
30	68	Unlike original patent claim 30, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 30, presented reissue claim 68 does not recite the language "wherein the gas is NO_x."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
31	68	Unlike original patent claim 31, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 31, presented reissue claim 68 does not recite the language "wherein the gas is hydrogen."
32	68	Unlike original patent claim 32, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 32, presented reissue claim 68 does not recite the language "wherein the gas is H_2S."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
33	68	Unlike original patent claim 33, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 33, presented reissue claim 68 does not recite the language "wherein the gas is H_2O vapor."
34	68	Unlike original patent claim 34, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor" and also recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 34, presented reissue claim 68 does not recite the language "wherein the gas is alcohol vapor."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
35	68	Unlike original patent claim 35, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 35, presented reissue claim 68 does not recite the language "a second protonic conductive electrolyte membrane permeable to water vapor;" does not recite the language "and said first pump electrode having a surface exposed to the ambient atmosphere, said second pump electrode being separated from said counter electrode by said means for exposing a surface of said second pump electrode to said water vapor, and said counter electrode having a surface exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor," and also does not recite the language "means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first and second pump electrodes; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said second protonic electrolyte membrane."
36	68	Unlike original patent claim 36, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 36, presented reissue claim 68 does not recite the language "wherein at least one of said first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
37	68	Unlike original patent claim 37, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 37, presented reissue claim 68 does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductor electrolyte membrane."
38	68	Unlike original patent claim 38, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 38, presented reissue claim 68 does not recite the language "wherein the surface of said first pump electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, and wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere, the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
39	68	Unlike original patent claim 39, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 39, presented reissue claim 68 does not recite the language "wherein the surface area of each of the surfaces of the second pump and counter electrodes that are exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor are each separated from said means for exposing a surface of said second pump electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
40	68	Unlike original patent claim 40, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 40, presented reissue claim 68 does not recite the language "wherein said means for exposing a surface of said second pump electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
41	68	Unlike original patent claim 41, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 41, presented reissue claim 68 does not recite the language "wherein at least one of the surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar, and wherein at least one of the surfaces of said second protonic conductive electrolyte membrane in contact with one of the first and second pump electrodes is substantially nonplanar."
42	68	Unlike original patent claim 42, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 42, presented reissue claim 68 does not recite the language "wherein at least one of the sensing, counter, first pump, and second pump electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
43	68	Unlike original patent claim 43, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 43, presented reissue claim 68 does not recite the language "wherein the film is substantially composed of a noble metal."
44	68	Unlike original patent claim 44, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 44, presented reissue claim 68 does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
45	68	Unlike original patent claim 45, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 45, presented reissue claim 68 does not recite the language "wherein the at least one of the sensing, counter, first pump, and second pump electrodes is substantially comprised of proton conductive material."
46	68	Unlike original patent claim 46, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 46, presented reissue claim 68 does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
47	68	Unlike original patent claim 47, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 47, presented reissue claim 68 does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductive electrolyte membrane."
48	68	Unlike original patent claim 48, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 48, presented reissue claim 68 does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, first pump, and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
49	68	Unlike original patent claim 49, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 49, presented reissue claim 68 does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, first pump, and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
50	68	Unlike original patent claim 50, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 50, presented reissue claim 68 does not recite the language wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump and second pump electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
51	68	Unlike original patent claim 51, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 51, presented reissue claim 68 does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
52	68	Unlike original patent claim 52, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 52, presented reissue claim 68 does not recite the language "a reference electrode permeable to water vapor and comprised of an electrical conducting material; a counter electrode permeable to water vapor and comprised of an electrical conducting material and being separate from both said sensing and reference electrodes, and being exposed to the ambient atmosphere; a protonic conductive electrolyte membrane permeable to water vapor, having top and bottom sides, said bottom side of said protonic conductive membrane being in contact with the counter electrode, and the top side of said protonic conductive membrane being in contact with the sensing and reference electrodes;" and also does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, and reference electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
53	68	Unlike original patent claim 53, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 53, presented reissue claim 68 does not recite the language "further comprising: means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said counter electrode, whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said protonic electrolyte membrane."
54	68	Unlike original patent claim 54, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 54, presented reissue claim 68 does not recite the language "wherein said means for exposing a surface of said counter electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
55	68	Unlike original patent claim 55, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 55, presented reissue claim 68 does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere."
56	68	Unlike original patent claim 56, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 56, presented reissue claim 68 does not recite the language "wherein at least one of the surfaces of said protonic conductive electrolyte membrane in contact with one of the sensing, counter, and reference electrodes is substantially nonplanar."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
57	68	Unlike original patent claim 57, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 57, presented reissue claim 68 does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
58	68	Unlike original patent claim 58, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 58, presented reissue claim 68 does not recite the language "wherein at least one of the sensing, counter, and reference electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
59	68	Unlike original patent claim 59, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 59, presented reissue claim 68 does not recite the language "wherein the film is substantially composed of a noble metal."
60	68	Unlike original patent claim 60, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 60, presented reissue claim 68 does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
61	68	Unlike original patent claim 61, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 61, presented reissue claim 68 does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."
62	68	Unlike original patent claim 62, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 62, presented reissue claim 68 does not recite the language "wherein the protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
63	68	Unlike original patent claim 63, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 63, presented reissue claim 68 does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, and reference electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
64	68	Unlike original patent claim 64, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 64, presented reissue claim 68 does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
65	68	Unlike original patent claim 65, presented reissue claim 68 recites the language "a two-electrode electrochemical gas sensor," recites the language "the sensing electrode and the counter electrode being the only two electrodes in contact with the first protonic conductive electrolyte membrane, and the sensing electrode reacting with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode" and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 65, presented reissue claim 68 does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
1	69	Unlike original patent claim 1, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claims 1, presented reissue claim 69 does not recite the language "quantitative measurement."
2	69	Unlike original patent claim 2, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 2, presented reissue claim 69 does not recite the language "quantitative measurement," or the language "wherein said water vapor containing means contains a volume of water and an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
3	69	Unlike original patent claim 3, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 3, presented reissue claim 69 does not recite the language "quantitative measurement," and does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area that is smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode exposed to said water vapor to the surface of said sensing electrode exposed to the ambient atmosphere."
4	69	Unlike original patent claim 4, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 4, presented reissue claim 69 does not recite the language "quantitative measurement," and does not recite the language "wherein the surface area of the surface of the counter electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
5	69	Unlike original patent claim 5, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 5, presented reissue claim 69 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane has opposing surfaces, each of said opposing surfaces being in contact with one of the sensing and counter electrodes, wherein at least one of the opposing surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar."
6	69	Unlike original patent claim 6, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 6, presented reissue claim 69 does not recite the language "quantitative measurement," and does not recite the language "wherein at least one of the sensing and counter electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
7	69	Unlike original patent claim 7, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 7, presented reissue claim 69 does not recite the language "quantitative measurement," and does not recite the language "wherein the film is substantially composed of a noble metal."
8	69	Unlike original patent claim 8, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 8, presented reissue claim 69 does not recite the language "quantitative measurement," and does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
9	69	Unlike original patent claim 9, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 9, presented reissue claim 69 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."
10	69	Unlike original patent claim 10, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 10, presented reissue claim 69 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
11	69	Unlike original patent claim 11, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 11, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing and counter electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
12	69	Unlike original patent claim 12, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 12, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
13	69	Unlike original patent claim 13, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 13, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of Ru oxide."
14	69	Unlike original patent claim 14, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 14, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: first and second pump electrodes comprised of an electrical conducting material permeable to water vapor, separate from said sensing and counter electrodes, and situated on opposite sides of and in contact with said first protonic conductive electrolyte membrane, said second pump electrode being situated on the same side of said first protonic conductive membrane as the counter electrode and having a surface thereon exposed to the water vapor in said means for exposing a surface of said counter electrode to said water vapor; and means for applying a DC power across the first protonic conductive electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the first protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
15	69	Unlike original patent claim 15, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 15, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of carbon."
16	69	Unlike original patent claim 16, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 16, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
17	69	Unlike original patent claim 17, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 17, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of conductive hydrated metal oxides."
18	69	Unlike original patent claim 18, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 18, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second pump electrodes is comprised of a film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
19	69	Unlike original patent claim 19, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 19, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of said first and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."
20	69	Unlike original patent claim 20, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 20, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the first and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
21	69	Unlike original patent claim 21, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 21, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the first pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the first pump electrode is 1 to 50 wt % of platinum."
22	69	Unlike original patent claim 22, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 22, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the second pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the second pump electrode is 1 to 50 wt % of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
23	69	Unlike original patent claim 23, presented reissue claim 69 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” and also recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane.” Unlike original patent claim 23, presented reissue claim 69 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane permeable to water vapor; first and second pump electrodes permeable to water vapor and comprised of an electron conductive material, and being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane, said means for exposing a surface of said counter electrode to said water vapor exposing a surface of said second pump electrode to said water vapor, and said first pump electrode having a surface exposed to the ambient atmosphere; and means for applying a DC power across said second protonic electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes.”
24	69	Unlike original patent claim 24, presented reissue claim 69 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” and also recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane.” Unlike original patent claim 24, presented reissue claim 69 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the second protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
25	69	Unlike original patent claim 25 presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 25, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."
26	69	Unlike original patent claim 26, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 26, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface area of the surface of said first pump electrode that is exposed to the ambient atmosphere is smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, whereby the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
27	69	Unlike original patent claim 27, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 27, presented reissue claim 69 does not recite the language "quantitative measurement," and also doe snot recite the language "wherein the surface area of the surface of the second pump electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
28	69	Unlike original patent claim 28, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 28, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "further comprising: means for applying a DC pulse power source across the first protonic conductive membrane, said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the first protonic conductive membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the DC pulse power means; whereby, in a positive ambient atmosphere concentration of said gas, said electrical measurement means detects changes in said electrical characteristic when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said DC pulse power means moves the gas away from a side of the gas sensor where the counter electrode is placed when said switch means connects said DC pulse power means to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
29	69	Unlike original patent claim 29, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 29, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is CO."
30	69	Unlike original patent claim 30, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 30, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is NO_x."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
31	69	Unlike original patent claim 31, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 31, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is hydrogen."
32	69	Unlike original patent claim 32, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 32, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is H_2S."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
33	69	Unlike original patent claim 33, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 33, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is H_2O vapor."
34	69	Unlike original patent claim 34, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" and also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane." Unlike original patent claim 34, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is alcohol vapor."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
35	69	Unlike original patent claim 35, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 35, presented reissue claim 69 does not recite the language "quantitative measurement," does not recite the language "a second protonic conductive electrolyte membrane permeable to water vapor;" does not recite the language "and said first pump electrode having a surface exposed to the ambient atmosphere, said second pump electrode being separated from said counter electrode by said means for exposing a surface of said second pump electrode to said water vapor, and said counter electrode having a surface exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor," and also does not recite the language "means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first and second pump electrodes; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said second protonic electrolyte membrane."
36	69	Unlike original patent claim 36, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 36, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of said first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
37	69	Unlike original patent claim 35, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 35, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductor electrolyte membrane."
38	69	Unlike original patent claim 38, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 38, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface of said first pump electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, and wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere, the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
39	69	Unlike original patent claim 39, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 39, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface area of each of the surfaces of the second pump and counter electrodes that are exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor are each separated from said means for exposing a surface of said second pump electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
40	69	Unlike original patent claim 40, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 40, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein said means for exposing a surface of said second pump electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
41	69	Unlike original patent claim 41, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 41, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar, and wherein at least one of the surfaces of said second protonic conductive electrolyte membrane in contact with one of the first and second pump electrodes is substantially nonplanar."
42	69	Unlike original patent claim 42, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 42, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the sensing, counter, first pump, and second pump electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
43	69	Unlike original patent claim 43, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 43, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the film is substantially composed of a noble metal."
44	69	Unlike original patent claim 44, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 44, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
45	69	Unlike original patent claim 45, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 45, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the at least one of the sensing, counter, first pump, and second pump electrodes is substantially comprised of proton conductive material."
46	69	Unlike original patent claim 46, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 46, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
47	69	Unlike original patent claim 47, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 47, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductive electrolyte membrane."
48	69	Unlike original patent claim 48, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 48, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, first pump, and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
49	69	Unlike original patent claim 49, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 49, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, first pump, and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
50	69	Unlike original patent claim 50, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 50, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump and second pump electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
51	69	Unlike original patent claim 51, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 51, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
52	69	Unlike original patent claim 52, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 52, presented reissue claim 69 does not recite the language "quantitative measurement," and does not recite the language "a reference electrode permeable to water vapor and comprised of an electrical conducting material; a counter electrode permeable to water vapor and comprised of an electrical conducting material and being separate from both said sensing and reference electrodes, and being exposed to the ambient atmosphere; a protonic conductive electrolyte membrane permeable to water vapor, having top and bottom sides, said bottom side of said protonic conductive membrane being in contact with the counter electrode, and the top side of said protonic conductive membrane being in contact with the sensing and reference electrodes;" and also does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, and reference electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
53	69	Unlike original patent claim 53, presented reissue claim 69 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” and also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.” Unlike original patent claim 53, presented reissue claim 69 does not recite the language “quantitative measurement,” and also does not recite the language “further comprising: means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said counter electrode, whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said protonic electrolyte membrane.”
54	69	Unlike original patent claim 54, presented reissue claim 69 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” and also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.” Unlike original patent claim 54, presented reissue claim 69 does not recite the language “quantitative measurement,” and also does not recite the language “wherein said means for exposing a surface of said counter electrode to said water vapor further contains an antifreeze additive.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
55	69	Unlike original patent claim 55, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 55, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere."
56	69	Unlike original patent claim 56, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 56, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the surfaces of said protonic conductive electrolyte membrane in contact with one of the sensing, counter, and reference electrodes is substantially nonplanar."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
57	69	Unlike original patent claim 57, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 57, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
58	69	Unlike original patent claim 58, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 58, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the sensing, counter, and reference electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
59	69	Unlike original patent claim 59, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 59, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the film is substantially composed of a noble metal."
60	69	Unlike original patent claim 60, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 60, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
61	69	Unlike original patent claim 61, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 61, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."
62	69	Unlike original patent claim 62, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 62, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
63	69	Unlike original patent claim 63, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 63, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, and reference electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
64	69	Unlike original patent claim 64, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 64, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
65	69	Unlike original patent claim 65, presented reissue claim 69 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 65, presented reissue claim 69 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
1	70	Unlike original patent claim 1, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claims 1, presented reissue claim 70 does not recite the language "quantitative measurement."
2	70	Unlike original patent claim 2, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 2, presented reissue claim 70 does not recite the language "quantitative measurement," or the language "wherein said water vapor containing means contains a volume of water and an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
3	70	Unlike original patent claim 3, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 3, presented reissue claim 70 does not recite the language "quantitative measurement," and does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area that is smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode exposed to said water vapor to the surface of said sensing electrode exposed to the ambient atmosphere."
4	70	Unlike original patent claim 4, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 4, presented reissue claim 70 does not recite the language "quantitative measurement," and does not recite the language "wherein the surface area of the surface of the counter electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
5	70	Unlike original patent claim 5, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 5, presented reissue claim 70 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane has opposing surfaces, each of said opposing surfaces being in contact with one of the sensing and counter electrodes, wherein at least one of the opposing surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar."
6	70	Unlike original patent claim 6, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 6, presented reissue claim 70 does not recite the language "quantitative measurement," and does not recite the language "wherein at least one of the sensing and counter electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
7	70	Unlike original patent claim 7, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 7, presented reissue claim 70 does not recite the language "quantitative measurement," and does not recite the language "wherein the film is substantially composed of a noble metal."
8	70	Unlike original patent claim 8, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 8, presented reissue claim 70 does not recite the language "quantitative measurement," and does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
9	70	Unlike original patent claim 9, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 9, presented reissue claim 70 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."
10	70	Unlike original patent claim 10, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 10, presented reissue claim 70 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
11	70	Unlike original patent claim 11, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 11, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing and counter electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
12	70	Unlike original patent claim 12, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 12, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
13	70	Unlike original patent claim 13, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 13, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of Ru oxide."
14	70	Unlike original patent claim 14, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 14, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: first and second pump electrodes comprised of an electrical conducting material permeable to water vapor, separate from said sensing and counter electrodes, and situated on opposite sides of and in contact with said first protonic conductive electrolyte membrane, said second pump electrode being situated on the same side of said first protonic conductive membrane as the counter electrode and having a surface thereon exposed to the water vapor in said means for exposing a surface of said counter electrode to said water vapor; and means for applying a DC power across the first protonic conductive electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the first protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
15	70	Unlike original patent claim 15, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 15, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of carbon."
16	70	Unlike original patent claim 16, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 16, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
17	70	Unlike original patent claim 17, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 17, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of conductive hydrated metal oxides."
18	70	Unlike original patent claim 18, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 18, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second pump electrodes is comprised of a film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
19	70	Unlike original patent claim 19, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 19, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of said first and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."
20	70	Unlike original patent claim 20, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 20, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the first and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
21	70	Unlike original patent claim 21, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 21, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the first pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the first pump electrode is 1 to 50 wt % of platinum."
22	70	Unlike original patent claim 22, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 22, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the second pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the second pump electrode is 1 to 50 wt % of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
23	70	Unlike original patent claim 23, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 23, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane permeable to water vapor; first and second pump electrodes permeable to water vapor and comprised of an electron conductive material, and being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane, said means for exposing a surface of said counter electrode to said water vapor exposing a surface of said second pump electrode to said water vapor, and said first pump electrode having a surface exposed to the ambient atmosphere; and means for applying a DC power across said second protonic electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."
24	70	Unlike original patent claim 24, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 24, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
25	70	Unlike original patent claim 25, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 25, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."
26	70	Unlike original patent claim 26, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 26, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface area of the surface of said first pump electrode that is exposed to the ambient atmosphere is smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, whereby the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
27	70	Unlike original patent claim 27, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 27, presented reissue claim 70 does not recite the language "quantitative measurement," and also doe snot recite the language "wherein the surface area of the surface of the second pump electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
28	70	Unlike original patent claim 28, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 28, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "further comprising: means for applying a DC pulse power source across the first protonic conductive membrane, said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the first protonic conductive membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the DC pulse power means; whereby, in a positive ambient atmosphere concentration of said gas, said electrical measurement means detects changes in said electrical characteristic when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said DC pulse power means moves the gas away from a side of the gas sensor where the counter electrode is placed when said switch means connects said DC pulse power means to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
29	70	Unlike original patent claim 29, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 29, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is CO."
30	70	Unlike original patent claim 30, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane." Unlike original patent claim 30, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is NO_x."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
31	70	Unlike original patent claim 31, presented reissue claim 70 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” and also recites the language “the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane.” Unlike original patent claim 31, presented reissue claim 70 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the gas is hydrogen.”
32	70	Unlike original patent claim 32, presented reissue claim 70 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” and also recites the language “the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane.” Unlike original patent claim 32, presented reissue claim 70 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the gas is H_2S.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
33	70	Unlike original patent claim 33, presented reissue claim 70 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” and also recites the language “the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane.” Unlike original patent claim 33, presented reissue claim 70 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the gas is H_2O vapor.”
34	70	Unlike original patent claim 34, presented reissue claim 70 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” and also recites the language “the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane.” Unlike original patent claim 34, presented reissue claim 70 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the gas is alcohol vapor.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
35	70	Unlike original patent claim 35, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 35, presented reissue claim 70 does not recite the language "quantitative measurement," does not recite the language "a second protonic conductive electrolyte membrane permeable to water vapor;" does not recite the language "and said first pump electrode having a surface exposed to the ambient atmosphere, said second pump electrode being separated from said counter electrode by said means for exposing a surface of said second pump electrode to said water vapor, and said counter electrode having a surface exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor," and also does not recite the language "means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first and second pump electrodes; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said second protonic electrolyte membrane."
36	70	Unlike original patent claim 36, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 36, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of said first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
37	70	Unlike original patent claim 37, presented reissue claim 70 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane,” and also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.” Unlike original patent claim 37, presented reissue claim 70 does not recite the language “quantitative measurement,” and also does not recite the language “wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductor electrolyte membrane.”
38	70	Unlike original patent claim 38, presented reissue claim 70 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane,” and also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.” Unlike original patent claim 38, presented reissue claim 70 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the surface of said first pump electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, and wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere, the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
39	70	Unlike original patent claim 39, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 39, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface area of each of the surfaces of the second pump and counter electrodes that are exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor are each separated from said means for exposing a surface of said second pump electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
40	70	Unlike original patent claim 40, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 40, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein said means for exposing a surface of said second pump electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
41	70	Unlike original patent claim 41, presented reissue claim 70 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane,” and also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.” Unlike original patent claim 41, presented reissue claim 70 does not recite the language “quantitative measurement,” and also does not recite the language “wherein at least one of the surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar, and wherein at least one of the surfaces of said second protonic conductive electrolyte membrane in contact with one of the first and second pump electrodes is substantially nonplanar.”
42	70	Unlike original patent claim 42, presented reissue claim 70 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane,” and also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.” Unlike original patent claim 42, presented reissue claim 70 does not recite the language “quantitative measurement,” and also does not recite the language “wherein at least one of the sensing, counter, first pump, and second pump electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
43	70	Unlike original patent claim 43, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 43, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the film is substantially composed of a noble metal."
44	70	Unlike original patent claim 44, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 44, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
45	70	Unlike original patent claim 45, presented reissue claim 70 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane,” and also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.” Unlike original patent claim 45, presented reissue claim 70 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the at least one of the sensing, counter, first pump, and second pump electrodes is substantially comprised of proton conductive material.”
46	70	Unlike original patent claim 46, presented reissue claim 70 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane,” and also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.” Unlike original patent claim 46, presented reissue claim 70 does not recite the language “quantitative measurement,” and also does not recite the language “wherein at least one of the first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
47	70	Unlike original patent claim 47, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 47, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductive electrolyte membrane."
48	70	Unlike original patent claim 48, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 48, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, first pump, and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
49	70	Unlike original patent claim 49, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 49, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, first pump, and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
50	70	Unlike original patent claim 50, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 50, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump and second pump electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
51	70	Unlike original patent claim 51, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 51, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
52	70	Unlike original patent claim 52, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 52, presented reissue claim 70 does not recite the language "quantitative measurement," and does not recite the language "a reference electrode permeable to water vapor and comprised of an electrical conducting material; a counter electrode permeable to water vapor and comprised of an electrical conducting material and being separate from both said sensing and reference electrodes, and being exposed to the ambient atmosphere; a protonic conductive electrolyte membrane permeable to water vapor, having top and bottom sides, said bottom side of said protonic conductive membrane being in contact with the counter electrode, and the top side of said protonic conductive membrane being in contact with the sensing and reference electrodes;" and also does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, and reference electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
53	70	Unlike original patent claim 53, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 53, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "further comprising: means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said counter electrode, whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said protonic electrolyte membrane."
54	70	Unlike original patent claim 54, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 54, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein said means for exposing a surface of said counter electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
55	70	Unlike original patent claim 55, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 55, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere."
56	70	Unlike original patent claim 56, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 56, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the surfaces of said protonic conductive electrolyte membrane in contact with one of the sensing, counter, and reference electrodes is substantially nonplanar."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
57	70	Unlike original patent claim 57, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 57, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
58	70	Unlike original patent claim 58, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 58, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the sensing, counter, and reference electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
59	70	Unlike original patent claim 59, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 59, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the film is substantially composed of a noble metal."
60	70	Unlike original patent claim 60, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 60, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
61	70	Unlike original patent claim 61, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 61, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."
62	70	Unlike original patent claim 62, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 62, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
63	70	Unlike original patent claim 63, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 63, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, and reference electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
64	70	Unlike original patent claim 64, presented reissue claim 70 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 64, presented reissue claim 70 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
65	70	Unlike original patent claim 65, presented reissue claim 70 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane,” and also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.” Unlike original patent claim 65, presented reissue claim 70 does not recite the language “quantitative measurement,” and also does not recite the language “wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of Ru oxide.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
1	71	Unlike original patent claim 1, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claims 1, presented reissue claim 71 does not recite the language "quantitative measurement."
2	71	Unlike original patent claim 2, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 2, presented reissue claim 71 does not recite the language "quantitative measurement," or the language "wherein said water vapor containing means contains a volume of water and an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
3	71	Unlike original patent claim 3, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 3, presented reissue claim 71 does not recite the language "quantitative measurement," and does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area that is smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode exposed to said water vapor to the surface of said sensing electrode exposed to the ambient atmosphere."
4	71	Unlike original patent claim 4, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 4, presented reissue claim 71 does not recite the language "quantitative measurement," and does not recite the language "wherein the surface area of the surface of the counter electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
5	71	Unlike original patent claim 5, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 5, presented reissue claim 71 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane has opposing surfaces, each of said opposing surfaces being in contact with one of the sensing and counter electrodes, wherein at least one of the opposing surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar."
6	71	Unlike original patent claim 6, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 6, presented reissue claim 71 does not recite the language "quantitative measurement," and does not recite the language "wherein at least one of the sensing and counter electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
7	71	Unlike original patent claim 7, presented reissue claim 71 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere,” also recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language “the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.” Unlike original patent claim 7, presented reissue claim 71 does not recite the language “quantitative measurement,” and does not recite the language “wherein the film is substantially composed of a noble metal.”
8	71	Unlike original patent claim 8, presented reissue claim 71 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere,” also recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language “the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.” Unlike original patent claim 8, presented reissue claim 71 does not recite the language “quantitative measurement,” and does not recite the language “wherein the noble metal is platinum.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
9	71	Unlike original patent claim 9, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 9, presented reissue claim 71 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."
10	71	Unlike original patent claim 10, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 10, presented reissue claim 71 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
11	71	Unlike original patent claim 11, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 11, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing and counter electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
12	71	Unlike original patent claim 12, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 12, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
13	71	Unlike original patent claim 13, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 13, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of Ru oxide."
14	71	Unlike original patent claim 14, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 14, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: first and second pump electrodes comprised of an electrical conducting material permeable to water vapor, separate from said sensing and counter electrodes, and situated on opposite sides of and in contact with said first protonic conductive electrolyte membrane, said second pump electrode being situated on the same side of said first protonic conductive membrane as the counter electrode and having a surface thereon exposed to the water vapor in said means for exposing a surface of said counter electrode to said water vapor; and means for applying a DC power across the first protonic conductive electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the first protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
15	71	Unlike original patent claim 15, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 15, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of carbon."
16	71	Unlike original patent claim 16, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 16, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
17	71	Unlike original patent claim 17, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 17, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of conductive hydrated metal oxides."
18	71	Unlike original patent claim 18, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 18, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second pump electrodes is comprised of a film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
19	71	Unlike original patent claim 19, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 19, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of said first and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."
20	71	Unlike original patent claim 20, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 20, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the first and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
21	71	Unlike original patent claim 21, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 21, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the first pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the first pump electrode is 1 to 50 wt % of platinum."
22	71	Unlike original patent claim 22, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 22, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the second pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the second pump electrode is 1 to 50 wt % of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
23	71	Unlike original patent claim 23, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 23, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane permeable to water vapor; first and second pump electrodes permeable to water vapor and comprised of an electron conductive material, and being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane, said means for exposing a surface of said counter electrode to said water vapor exposing a surface of said second pump electrode to said water vapor, and said first pump electrode having a surface exposed to the ambient atmosphere; and means for applying a DC power across said second protonic electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."
24	71	Unlike original patent claim 24, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 24, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
25	71	Unlike original patent claim 25, presented reissue claim 71 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere,” also recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language “the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.” Unlike original patent claim 25, presented reissue claim 71 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the second protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane.”
26	71	Unlike original patent claim 26, presented reissue claim 71 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere,” also recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language “the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.” Unlike original patent claim 26, presented reissue claim 71 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the surface area of the surface of said first pump electrode that is exposed to the ambient atmosphere is smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, whereby the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
27	71	Unlike original patent claim 27, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 27, presented reissue claim 71 does not recite the language "quantitative measurement," and also doe snot recite the language "wherein the surface area of the surface of the second pump electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
28	71	Unlike original patent claim 28, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 28, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "further comprising: means for applying a DC pulse power source across the first protonic conductive membrane, said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the first protonic conductive membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the DC pulse power means; whereby, in a positive ambient atmosphere concentration of said gas, said electrical measurement means detects changes in said electrical characteristic when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said DC pulse power means moves the gas away from a side of the gas sensor where the counter electrode is placed when said switch means connects said DC pulse power means to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
29	71	Unlike original patent claim 29, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 29, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is CO."
30	71	Unlike original patent claim 30, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 30, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is NO_x."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
31	71	Unlike original patent claim 31, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 31, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is hydrogen."
32	71	Unlike original patent claim 32, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 32, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is H_2S."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
33	71	Unlike original patent claim 33, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 33, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is H_2O vapor."
34	71	Unlike original patent claim 34, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane, and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 34, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is alcohol vapor."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
35	71	Unlike original patent claim 35, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 35, presented reissue claim 71 does not recite the language "quantitative measurement," does not recite the language "a second protonic conductive electrolyte membrane permeable to water vapor;" does not recite the language "and said first pump electrode having a surface exposed to the ambient atmosphere, said second pump electrode being separated from said counter electrode by said means for exposing a surface of said second pump electrode to said water vapor, and said counter electrode having a surface exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor," and also does not recite the language "means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first and second pump electrodes; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said second protonic electrolyte membrane."
36	71	Unlike original patent claim 36, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 36, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of said first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
37	71	Unlike original patent claim 37, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 37, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductor electrolyte membrane."
38	71	Unlike original patent claim 38, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 38, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface of said first pump electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, and wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere, the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
39	71	Unlike original patent claim 39, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 39, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface area of each of the surfaces of the second pump and counter electrodes that are exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor are each separated from said means for exposing a surface of said second pump electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
40	71	Unlike original patent claim 40, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 40, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein said means for exposing a surface of said second pump electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
41	71	Unlike original patent claim 41, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 41, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar, and wherein at least one of the surfaces of said second protonic conductive electrolyte membrane in contact with one of the first and second pump electrodes is substantially nonplanar."
42	71	Unlike original patent claim 42, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 42, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the sensing, counter, first pump, and second pump electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
43	71	Unlike original patent claim 43, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 43, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the film is substantially composed of a noble metal."
44	71	Unlike original patent claim 44, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 44, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
45	71	Unlike original patent claim 45, presented reissue claim 71 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” recites the language “the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode,” and also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.” Unlike original patent claim 45, presented reissue claim 71 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the at least one of the sensing, counter, first pump, and second pump electrodes is substantially comprised of proton conductive material.”
46	71	Unlike original patent claim 46, presented reissue claim 71 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” recites the language “the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode,” and also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.” Unlike original patent claim 46, presented reissue claim 71 does not recite the language “quantitative measurement,” and also does not recite the language “wherein at least one of the first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
47	71	Unlike original patent claim 47, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 47, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductive electrolyte membrane."
48	71	Unlike original patent claim 48, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 48, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, first pump, and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
49	71	Unlike original patent claim 49, presented reissue claim 71 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” recites the language “the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode,” and also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.” Unlike original patent claim 49, presented reissue claim 71 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the proton conductor material for said at least one of the sensing, counter, first pump, and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group.”
50	71	Unlike original patent claim 50, presented reissue claim 71 recites the language “an electrochemical gas sensor for sensing a gas in an ambient atmosphere” recites the language “the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane,” recites the language “the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode,” and also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.” Unlike original patent claim 50, presented reissue claim 71 does not recite the language “quantitative measurement,” and also does not recite the language “wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump and second pump electrodes is about 1-50 wt % of platinum.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
51	71	Unlike original patent claim 51, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 51, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
52	71	Unlike original patent claim 52, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 52, presented reissue claim 71 does not recite the language "quantitative measurement," and does not recite the language "a reference electrode permeable to water vapor and comprised of an electrical conducting material; a counter electrode permeable to water vapor and comprised of an electrical conducting material and being separate from both said sensing and reference electrodes, and being exposed to the ambient atmosphere; a protonic conductive electrolyte membrane permeable to water vapor, having top and bottom sides, said bottom side of said protonic conductive membrane being in contact with the counter electrode, and the top side of said protonic conductive membrane being in contact with the sensing and reference electrodes;" and also does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, and reference electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
53	71	Unlike original patent claim 53, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 53, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "further comprising: means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said counter electrode, whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said protonic electrolyte membrane."
54	71	Unlike original patent claim 54, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 54, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein said means for exposing a surface of said counter electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
55	71	Unlike original patent claim 55, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 55, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere."
56	71	Unlike original patent claim 56, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 56, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the surfaces of said protonic conductive electrolyte membrane in contact with one of the sensing, counter, and reference electrodes is substantially nonplanar."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
57	71	Unlike original patent claim 57, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 57, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
58	71	Unlike original patent claim 58, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 58, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the sensing, counter, and reference electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
59	71	Unlike original patent claim 59, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 59, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the film is substantially composed of a noble metal."
60	71	Unlike original patent claim 60, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 60, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
61	71	Unlike original patent claim 61, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 61, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."
62	71	Unlike original patent claim 62, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 62, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
63	71	Unlike original patent claim 63, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 63, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, and reference electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
64	71	Unlike original patent claim 64, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 64, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
65	71	Unlike original patent claim 65, presented reissue claim 71 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 65, presented reissue claim 71 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
1	72	Unlike original patent claim 1, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claims 1, presented reissue claim 72 does not recite the language "quantitative measurement."
2	72	Unlike original patent claim 2, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 2, presented reissue claim 72 does not recite the language "quantitative measurement," or the language "wherein said water vapor containing means contains a volume of water and an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
3	72	Unlike original patent claim 3, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 3, presented reissue claim 72 does not recite the language "quantitative measurement," and does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area that is smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode exposed to said water vapor to the surface of said sensing electrode exposed to the ambient atmosphere."
4	72	Unlike original patent claim 4, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 4, presented reissue claim 72 does not recite the language "quantitative measurement," and does not recite the language "wherein the surface area of the surface of the counter electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
5	72	Unlike original patent claim 5, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 5, presented reissue claim 72 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane has opposing surfaces, each of said opposing surfaces being in contact with one of the sensing and counter electrodes, wherein at least one of the opposing surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar."
6	72	Unlike original patent claim 6, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 6, presented reissue claim 72 does not recite the language "quantitative measurement," and does not recite the language "wherein at least one of the sensing and counter electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
7	72	Unlike original patent claim 7, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 7, presented reissue claim 72 does not recite the language "quantitative measurement," and does not recite the language "wherein the film is substantially composed of a noble metal."
8	72	Unlike original patent claim 8, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 8, presented reissue claim 72 does not recite the language "quantitative measurement," and does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
9	72	Unlike original patent claim 9, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 9, presented reissue claim 72 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."
10	72	Unlike original patent claim 10, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 10, presented reissue claim 72 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
11	72	Unlike original patent claim 11, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 11, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing and counter electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
12	72	Unlike original patent claim 12, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 12, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
13	72	Unlike original patent claim 13, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 13, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of Ru oxide."
14	72	Unlike original patent claim 14, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 14, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: first and second pump electrodes comprised of an electrical conducting material permeable to water vapor, separate from said sensing and counter electrodes, and situated on opposite sides of and in contact with said first protonic conductive electrolyte membrane, said second pump electrode being situated on the same side of said first protonic conductive membrane as the counter electrode and having a surface thereon exposed to the water vapor in said means for exposing a surface of said counter electrode to said water vapor; and means for applying a DC power across the first protonic conductive electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the first protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
15	72	Unlike original patent claim 15, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 15, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of carbon."
16	72	Unlike original patent claim 16, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 16, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
17	72	Unlike original patent claim 17, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 17, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of conductive hydrated metal oxides."
18	72	Unlike original patent claim 18, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 18, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second pump electrodes is comprised of a film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
19	72	Unlike original patent claim 19, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 19, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of said first and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."
20	72	Unlike original patent claim 20, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 20, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the first and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
21	72	Unlike original patent claim 21, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 21, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the first pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the first pump electrode is 1 to 50 wt % of platinum."
22	72	Unlike original patent claim 22, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 22, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the second pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the second pump electrode is 1 to 50 wt % of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
23	72	Unlike original patent claim 23, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 23, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane permeable to water vapor; first and second pump electrodes permeable to water vapor and comprised of an electron conductive material, and being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane, said means for exposing a surface of said counter electrode to said water vapor exposing a surface of said second pump electrode to said water vapor, and said first pump electrode having a surface exposed to the ambient atmosphere; and means for applying a DC power across said second protonic electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."
24	72	Unlike original patent claim 24, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 24, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
25	72	Unlike original patent claim 25, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 25, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."
26	72	Unlike original patent claim 26, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 26, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface area of the surface of said first pump electrode that is exposed to the ambient atmosphere is smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, whereby the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
27	72	Unlike original patent claim 27, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 27, presented reissue claim 72 does not recite the language "quantitative measurement," and also doe snot recite the language "wherein the surface area of the surface of the second pump electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
28	72	Unlike original patent claim 28, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 28, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "further comprising: means for applying a DC pulse power source across the first protonic conductive membrane, said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the first protonic conductive membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the DC pulse power means; whereby, in a positive ambient atmosphere concentration of said gas, said electrical measurement means detects changes in said electrical characteristic when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said DC pulse power means moves the gas away from a side of the gas sensor where the counter electrode is placed when said switch means connects said DC pulse power means to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
29	72	Unlike original patent claim 29, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 29, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is CO."
30	72	Unlike original patent claim 30, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 30, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is NO_x."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
31	72	Unlike original patent claim 31, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 31, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is hydrogen."
32	72	Unlike original patent claim 32, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 32, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is H_2S."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
33	72	Unlike original patent claim 33, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 33, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is H_2O vapor."
34	72	Unlike original patent claim 34, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 34, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is alcohol vapor."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
35	72	Unlike original patent claim 35, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 35, presented reissue claim 72 does not recite the language "quantitative measurement," does not recite the language "a second protonic conductive electrolyte membrane permeable to water vapor;" does not recite the language "and said first pump electrode having a surface exposed to the ambient atmosphere, said second pump electrode being separated from said counter electrode by said means for exposing a surface of said second pump electrode to said water vapor, and said counter electrode having a surface exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor," and also does not recite the language "means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first and second pump electrodes; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said second protonic electrolyte membrane."
36	72	Unlike original patent claim 36, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 36, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of said first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
37	72	Unlike original patent claim 37, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 37, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductor electrolyte membrane."
38	72	Unlike original patent claim 38, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 38, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface of said first pump electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, and wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere, the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
39	72	Unlike original patent claim 39, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 39, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface area of each of the surfaces of the second pump and counter electrodes that are exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor are each separated from said means for exposing a surface of said second pump electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
40	72	Unlike original patent claim 40, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 40, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein said means for exposing a surface of said second pump electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
41	72	Unlike original patent claim 41, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 41, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar, and wherein at least one of the surfaces of said second protonic conductive electrolyte membrane in contact with one of the first and second pump electrodes is substantially nonplanar."
42	72	Unlike original patent claim 42, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 42, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the sensing, counter, first pump, and second pump electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
43	72	Unlike original patent claim 43, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 43, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the film is substantially composed of a noble metal."
44	72	Unlike original patent claim 44, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 44, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
45	72	Unlike original patent claim 45, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 45, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the at least one of the sensing, counter, first pump, and second pump electrodes is substantially comprised of proton conductive material."
46	72	Unlike original patent claim 46, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 46, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
47	72	Unlike original patent claim 47, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 47, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductive electrolyte membrane."
48	72	Unlike original patent claim 48, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 48, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, first pump, and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
49	72	Unlike original patent claim 49, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 49, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, first pump, and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
50	72	Unlike original patent claim 50, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 50, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump and second pump electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
51	72	Unlike original patent claim 51, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 51, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
52	72	Unlike original patent claim 52, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 52, presented reissue claim 72 does not recite the language "quantitative measurement," and does not recite the language "a reference electrode permeable to water vapor and comprised of an electrical conducting material; a counter electrode permeable to water vapor and comprised of an electrical conducting material and being separate from both said sensing and reference electrodes, and being exposed to the ambient atmosphere; a protonic conductive electrolyte membrane permeable to water vapor, having top and bottom sides, said bottom side of said protonic conductive membrane being in contact with the counter electrode, and the top side of said protonic conductive membrane being in contact with the sensing and reference electrodes;" and also does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, and reference electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
53	72	Unlike original patent claim 53, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 53, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "further comprising: means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said counter electrode, whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said protonic electrolyte membrane."
54	72	Unlike original patent claim 54, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 54, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein said means for exposing a surface of said counter electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
55	72	Unlike original patent claim 55, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 55, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere."
56	72	Unlike original patent claim 56, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 56, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the surfaces of said protonic conductive electrolyte membrane in contact with one of the sensing, counter, and reference electrodes is substantially nonplanar."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
57	72	Unlike original patent claim 57, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 57, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
58	72	Unlike original patent claim 58, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 58, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the sensing, counter, and reference electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
59	72	Unlike original patent claim 59, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 59, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the film is substantially composed of a noble metal."
60	72	Unlike original patent claim 60, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 60, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
61	72	Unlike original patent claim 61, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 61, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."
62	72	Unlike original patent claim 62, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 62, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
63	72	Unlike original patent claim 63, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 63, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, and reference electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
64	72	Unlike original patent claim 64, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 64, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
65	72	Unlike original patent claim 65, presented reissue claim 72 recites the language "an electrochemical gas sensor for sensing a gas in an ambient atmosphere" recites the language "the sensing electrode and the counter electrode being on opposite sides of the first protonic conductive electrolyte membrane," also recites the language the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode," and also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material." Unlike original patent claim 65, presented reissue claim 72 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
1	73	Unlike original patent claim 1, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claims 1, presented reissue claim 73 does not recite the language "quantitative measurement."
2	73	Unlike original patent claim 2, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 2, presented reissue claim 73 does not recite the language "quantitative measurement," or the language "wherein said water vapor containing means contains a volume of water and an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
3	73	Unlike original patent claim 3, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 3, presented reissue claim 73 does not recite the language "quantitative measurement," and does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area that is smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode exposed to said water vapor to the surface of said sensing electrode exposed to the ambient atmosphere."
4	73	Unlike original patent claim 4, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 4, presented reissue claim 73 does not recite the language "quantitative measurement," and does not recite the language "wherein the surface area of the surface of the counter electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
5	73	Unlike original patent claim 5, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 5, presented reissue claim 73 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane has opposing surfaces, each of said opposing surfaces being in contact with one of the sensing and counter electrodes, wherein at least one of the opposing surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar."
6	73	Unlike original patent claim 6, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 6, presented reissue claim 73 does not recite the language "quantitative measurement," and does not recite the language "wherein at least one of the sensing and counter electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
7	73	Unlike original patent claim 7, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 7, presented reissue claim 73 does not recite the language "quantitative measurement," and does not recite the language "wherein the film is substantially composed of a noble metal."
8	73	Unlike original patent claim 8, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 8, presented reissue claim 73 does not recite the language "quantitative measurement," and does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
9	73	Unlike original patent claim 9, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 9, presented reissue claim 73 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."
10	73	Unlike original patent claim 10, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 10, presented reissue claim 73 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
11	73	Unlike original patent claim 11, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 11, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing and counter electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
12	73	Unlike original patent claim 12, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 12, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
13	73	Unlike original patent claim 13, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 13, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of Ru oxide."
14	73	Unlike original patent claim 14, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 14, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: first and second pump electrodes comprised of an electrical conducting material permeable to water vapor, separate from said sensing and counter electrodes, and situated on opposite sides of and in contact with said first protonic conductive electrolyte membrane, said second pump electrode being situated on the same side of said first protonic conductive membrane as the counter electrode and having a surface thereon exposed to the water vapor in said means for exposing a surface of said counter electrode to said water vapor; and means for applying a DC power across the first protonic conductive electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the first protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
15	73	Unlike original patent claim 15, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 15, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of carbon."
16	73	Unlike original patent claim 16, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 16, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
17	73	Unlike original patent claim 17, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 17, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of conductive hydrated metal oxides."
18	73	Unlike original patent claim 18, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 18, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second pump electrodes is comprised of a film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
19	73	Unlike original patent claim 19, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 19, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of said first and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."
20	73	Unlike original patent claim 20, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 20, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the first and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
21	73	Unlike original patent claim 21, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 21, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the first pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the first pump electrode is 1 to 50 wt % of platinum."
22	73	Unlike original patent claim 22, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 22, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the second pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the second pump electrode is 1 to 50 wt % of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
23	73	Unlike original patent claim 23, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 23, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane permeable to water vapor; first and second pump electrodes permeable to water vapor and comprised of an electron conductive material, and being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane, said means for exposing a surface of said counter electrode to said water vapor exposing a surface of said second pump electrode to said water vapor, and said first pump electrode having a surface exposed to the ambient atmosphere; and means for applying a DC power across said second protonic electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."
24	73	Unlike original patent claim 24, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 24, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
25	73	Unlike original patent claim 25, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 25, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."
26	73	Unlike original patent claim 26, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 26, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface area of the surface of said first pump electrode that is exposed to the ambient atmosphere is smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, whereby the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
27	73	Unlike original patent claim 27, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 27, presented reissue claim 73 does not recite the language "quantitative measurement," and also doe snot recite the language "wherein the surface area of the surface of the second pump electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
28	73	Unlike original patent claim 28, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 28, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "further comprising: means for applying a DC pulse power source across the first protonic conductive membrane, said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the first protonic conductive membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the DC pulse power means; whereby, in a positive ambient atmosphere concentration of said gas, said electrical measurement means detects changes in said electrical characteristic when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said DC pulse power means moves the gas away from a side of the gas sensor where the counter electrode is placed when said switch means connects said DC pulse power means to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
29	73	Unlike original patent claim 29, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 29, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is CO."
30	73	Unlike original patent claim 30, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere" and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 30, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is NO_x."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
31	73	Unlike original patent claim 31, presented reissue claim 73 recites the language “a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere” and also recites the language “said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage.” Unlike original patent claim 31, presented reissue claim 73 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the gas is hydrogen.”
32	73	Unlike original patent claim 32, presented reissue claim 73 recites the language “a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere” and also recites the language “said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage.” Unlike original patent claim 32, presented reissue claim 73 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the gas is H_2S.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
33	73	Unlike original patent claim 33, presented reissue claim 73 recites the language “a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere” and also recites the language “said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage.” Unlike original patent claim 33, presented reissue claim 73 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the gas is H_2O vapor.”
34	73	Unlike original patent claim 34, presented reissue claim 73 recites the language “a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere” and also recites the language “said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage.” Unlike original patent claim 34, presented reissue claim 73 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the gas is alcohol vapor.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
35	73	Unlike original patent claim 35, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 35, presented reissue claim 73 does not recite the language "quantitative measurement," does not recite the language "a second protonic conductive electrolyte membrane permeable to water vapor;" does not recite the language "and said first pump electrode having a surface exposed to the ambient atmosphere, said second pump electrode being separated from said counter electrode by said means for exposing a surface of said second pump electrode to said water vapor, and said counter electrode having a surface exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor," and also does not recite the language "means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first and second pump electrodes; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said second protonic electrolyte membrane."
36	73	Unlike original patent claim 36, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 36, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of said first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
37	73	Unlike original patent claim 37, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 37, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductor electrolyte membrane."
38	73	Unlike original patent claim 38, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 38, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface of said first pump electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, and wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere, the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
39	73	Unlike original patent claim 39, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 39, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface area of each of the surfaces of the second pump and counter electrodes that are exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor are each separated from said means for exposing a surface of said second pump electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
40	73	Unlike original patent claim 40, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 40, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein said means for exposing a surface of said second pump electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
41	73	Unlike original patent claim 41, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 41, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar, and wherein at least one of the surfaces of said second protonic conductive electrolyte membrane in contact with one of the first and second pump electrodes is substantially nonplanar."
42	73	Unlike original patent claim 42, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 42, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the sensing, counter, first pump, and second pump electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
43	73	Unlike original patent claim 43, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 43, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the film is substantially composed of a noble metal."
44	73	Unlike original patent claim 44, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 44, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
45	73	Unlike original patent claim 45, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 45, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the at least one of the sensing, counter, first pump, and second pump electrodes is substantially comprised of proton conductive material."
46	73	Unlike original patent claim 46, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 46, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
47	73	Unlike original patent claim 47, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 47, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductive electrolyte membrane."
48	73	Unlike original patent claim 48, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 48, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, first pump, and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
49	73	Unlike original patent claim 49, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 49, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, first pump, and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
50	73	Unlike original patent claim 50, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 50, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump and second pump electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
51	73	Unlike original patent claim 51, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 51, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
52	73	Unlike original patent claim 52, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 52, presented reissue claim 73 does not recite the language "quantitative measurement," and does not recite the language "a reference electrode permeable to water vapor and comprised of an electrical conducting material; a counter electrode permeable to water vapor and comprised of an electrical conducting material and being separate from both said sensing and reference electrodes, and being exposed to the ambient atmosphere; a protonic conductive electrolyte membrane permeable to water vapor, having top and bottom sides, said bottom side of said protonic conductive membrane being in contact with the counter electrode, and the top side of said protonic conductive membrane being in contact with the sensing and reference electrodes;" and also does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, and reference electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
53	73	Unlike original patent claim 53, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 53, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "further comprising: means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said counter electrode, whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said protonic electrolyte membrane."
54	73	Unlike original patent claim 54, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 54, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein said means for exposing a surface of said counter electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
55	73	Unlike original patent claim 55, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 55, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere."
56	73	Unlike original patent claim 56, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 56, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the surfaces of said protonic conductive electrolyte membrane in contact with one of the sensing, counter, and reference electrodes is substantially nonplanar."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
57	73	Unlike original patent claim 57, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 57, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
58	73	Unlike original patent claim 58, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 58, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the sensing, counter, and reference electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
59	73	Unlike original patent claim 59, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 59, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the film is substantially composed of a noble metal."
60	73	Unlike original patent claim 60, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 60, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
61	73	Unlike original patent claim 61, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 61, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."
62	73	Unlike original patent claim 62, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 62, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
63	73	Unlike original patent claim 63, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 63, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, and reference electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
64	73	Unlike original patent claim 64, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 64, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
65	73	Unlike original patent claim 65, presented reissue claim 73 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 65, presented reissue claim 73 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
1	74	Unlike original patent claim 1, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 1, presented reissue claim 74 does not recite the language "quantitative measurement."
2	74	Unlike original patent claim 2, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 2, presented reissue claim 74 does not recite the language "quantitative measurement," or the language "wherein said water vapor containing means contains a volume of water and an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
3	74	Unlike original patent claim 3, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 3, presented reissue claim 74 does not recite the language "quantitative measurement," and does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area that is smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode exposed to said water vapor to the surface of said sensing electrode exposed to the ambient atmosphere."
4	74	Unlike original patent claim 4, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 4, presented reissue claim 74 does not recite the language "quantitative measurement," and does not recite the language "wherein the surface area of the surface of the counter electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
5	74	Unlike original patent claim 5, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 5, presented reissue claim 74 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane has opposing surfaces, each of said opposing surfaces being in contact with one of the sensing and counter electrodes, wherein at least one of the opposing surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar."
6	74	Unlike original patent claim 6, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 6, presented reissue claim 74 does not recite the language "quantitative measurement," and does not recite the language "wherein at least one of the sensing and counter electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
7	74	Unlike original patent claim 7, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 7, presented reissue claim 74 does not recite the language "quantitative measurement," and does not recite the language "wherein the film is substantially composed of a noble metal."
8	74	Unlike original patent claim 8, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 8, presented reissue claim 74 does not recite the language "quantitative measurement," and does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
9	74	Unlike original patent claim 9, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 9, presented reissue claim 74 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."
10	74	Unlike original patent claim 10, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 10, presented reissue claim 74 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
11	74	Unlike original patent claim 11, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 11, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing and counter electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
12	74	Unlike original patent claim 12, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 12, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
13	74	Unlike original patent claim 13, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 13, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of Ru oxide."
14	74	Unlike original patent claim 14, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 14, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: first and second pump electrodes comprised of an electrical conducting material permeable to water vapor, separate from said sensing and counter electrodes, and situated on opposite sides of and in contact with said first protonic conductive electrolyte membrane, said second pump electrode being situated on the same side of said first protonic conductive membrane as the counter electrode and having a surface thereon exposed to the water vapor in said means for exposing a surface of said counter electrode to said water vapor; and means for applying a DC power across the first protonic conductive electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the first protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
15	74	Unlike original patent claim 15, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 15, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of carbon."
16	74	Unlike original patent claim 16, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 16, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
17	74	Unlike original patent claim 17, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 17, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of conductive hydrated metal oxides."
18	74	Unlike original patent claim 18, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 18, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second pump electrodes is comprised of a film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
19	74	Unlike original patent claim 19, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 19, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of said first and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."
20	74	Unlike original patent claim 20, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 20, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the first and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
21	74	Unlike original patent claim 21, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 21, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the first pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the first pump electrode is 1 to 50 wt % of platinum."
22	74	Unlike original patent claim 22, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 22, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the second pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the second pump electrode is 1 to 50 wt % of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
23	74	Unlike original patent claim 23, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 23, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane permeable to water vapor; first and second pump electrodes permeable to water vapor and comprised of an electron conductive material, and being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane, said means for exposing a surface of said counter electrode to said water vapor exposing a surface of said second pump electrode to said water vapor, and said first pump electrode having a surface exposed to the ambient atmosphere; and means for applying a DC power across said second protonic electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."
24	74	Unlike original patent claim 24, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 24, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
25	74	Unlike original patent claim 25 presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 25, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."
26	74	Unlike original patent claim 26, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 26, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface area of the surface of said first pump electrode that is exposed to the ambient atmosphere is smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, whereby the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
27	74	Unlike original patent claim 27, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 27, presented reissue claim 74 does not recite the language "quantitative measurement," and also doe snot recite the language "wherein the surface area of the surface of the second pump electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
28	74	Unlike original patent claim 28, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 28, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "further comprising: means for applying a DC pulse power source across the first protonic conductive membrane, said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the first protonic conductive membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the DC pulse power means; whereby, in a positive ambient atmosphere concentration of said gas, said electrical measurement means detects changes in said electrical characteristic when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said DC pulse power means moves the gas away from a side of the gas sensor where the counter electrode is placed when said switch means connects said DC pulse power means to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
29	74	Unlike original patent claim 29, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 29, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is CO."
30	74	Unlike original patent claim 30, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 30, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is NO_x."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
31	74	Unlike original patent claim 31, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 31, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is hydrogen."
32	74	Unlike original patent claim 32, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 32, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is H_2S."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
33	74	Unlike original patent claim 33, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 33, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is H_2O vapor."
34	74	Unlike original patent claim 34, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 34, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is alcohol vapor."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
35	74	Unlike original patent claim 35, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 35, presented reissue claim 74 does not recite the language "quantitative measurement," does not recite the language "a second protonic conductive electrolyte membrane permeable to water vapor;" does not recite the language "and said first pump electrode having a surface exposed to the ambient atmosphere, said second pump electrode being separated from said counter electrode by said means for exposing a surface of said second pump electrode to said water vapor, and said counter electrode having a surface exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor," and also does not recite the language "means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first and second pump electrodes; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said second protonic electrolyte membrane."
36	74	Unlike original patent claim 36, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 36, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of said first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
37	74	Unlike original patent claim 37, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 37, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductor electrolyte membrane."
38	74	Unlike original patent claim 38, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 38, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface of said first pump electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, and wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere, the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
39	74	Unlike original patent claim 39, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 39, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface area of each of the surfaces of the second pump and counter electrodes that are exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor are each separated from said means for exposing a surface of said second pump electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
40	74	Unlike original patent claim 40, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 40, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein said means for exposing a surface of said second pump electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
41	74	Unlike original patent claim 41, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 41, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar, and wherein at least one of the surfaces of said second protonic conductive electrolyte membrane in contact with one of the first and second pump electrodes is substantially nonplanar."
42	74	Unlike original patent claim 42, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 42, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the sensing, counter, first pump, and second pump electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
43	74	Unlike original patent claim 43, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 43, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the film is substantially composed of a noble metal."
44	74	Unlike original patent claim 44, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 44, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
45	74	Unlike original patent claim 45, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 45, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the at least one of the sensing, counter, first pump, and second pump electrodes is substantially comprised of proton conductive material."
46	74	Unlike original patent claim 46, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 46, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
47	74	Unlike original patent claim 47, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 47, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductive electrolyte membrane."
48	74	Unlike original patent claim 48, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 48, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, first pump, and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
49	74	Unlike original patent claim 49, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 49, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, first pump, and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
50	74	Unlike original patent claim 50, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 50, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump and second pump electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
51	74	Unlike original patent claim 51, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 51, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
52	74	Unlike original patent claim 52, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 52, presented reissue claim 74 does not recite the language "quantitative measurement," and does not recite the language "a reference electrode permeable to water vapor and comprised of an electrical conducting material; a counter electrode permeable to water vapor and comprised of an electrical conducting material and being separate from both said sensing and reference electrodes, and being exposed to the ambient atmosphere; a protonic conductive electrolyte membrane permeable to water vapor, having top and bottom sides, said bottom side of said protonic conductive membrane being in contact with the counter electrode, and the top side of said protonic conductive membrane being in contact with the sensing and reference electrodes;" and also does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, and reference electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
53	74	Unlike original patent claim 53, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 53, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "further comprising: means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said counter electrode, whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said protonic electrolyte membrane."
54	74	Unlike original patent claim 54, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 54, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein said means for exposing a surface of said counter electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
55	74	Unlike original patent claim 55, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 55, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere."
56	74	Unlike original patent claim 56, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 56, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the surfaces of said protonic conductive electrolyte membrane in contact with one of the sensing, counter, and reference electrodes is substantially nonplanar."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
57	74	Unlike original patent claim 57, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 57, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
58	74	Unlike original patent claim 58, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 58, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the sensing, counter, and reference electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
59	74	Unlike original patent claim 59, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 59, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the film is substantially composed of a noble metal."
60	74	Unlike original patent claim 60, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 60, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
61	74	Unlike original patent claim 61, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 61, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."
62	74	Unlike original patent claim 62, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 62, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
63	74	Unlike original patent claim 63, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 63, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, and reference electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
64	74	Unlike original patent claim 64, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 64, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
65	74	Unlike original patent claim 64, presented reissue claim 74 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "the sensing electrode and the counter electrode are the only two electrodes in contact with the first protonic conductive electrolyte membrane," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," and also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage." Unlike original patent claim 65, presented reissue claim 74 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
1	75	Unlike original patent claim 1, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 1, presented reissue claim 75 does not recite the language "quantitative measurement."
2	75	Unlike original patent claim 2, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 2, presented reissue claim 75 does not recite the language "quantitative measurement," or the language "wherein said water vapor containing means contains a volume of water and an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
3	75	Unlike original patent claim 3, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 3, presented reissue claim 75 does not recite the language "quantitative measurement," and does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area that is smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode exposed to said water vapor to the surface of said sensing electrode exposed to the ambient atmosphere."
4	75	Unlike original patent claim 4, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 4, presented reissue claim 75 does not recite the language "quantitative measurement," and does not recite the language "wherein the surface area of the surface of the counter electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
5	75	Unlike original patent claim 5, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 5, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode."
6	75	Unlike original patent claim 6, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 6, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
7	75	Unlike original patent claim 7, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 7, presented reissue claim 75 does not recite the language "quantitative measurement," and does not recite the language "wherein the film is substantially composed of a noble metal."
8	75	Unlike original patent claim 8, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 8, presented reissue claim 75 does not recite the language "quantitative measurement," and does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
9	75	Unlike original patent claim 9, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 9, presented reissue claim 75 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."
10	75	Unlike original patent claim 10, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 10, presented reissue claim 75 does not recite the language "quantitative measurement," and does not recite the language "wherein the first protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
11	75	Unlike original patent claim 11, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 11, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing and counter electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
12	75	Unlike original patent claim 12, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 12, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
13	75	Unlike original patent claim 13, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 13, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing and counter electrodes is about 1-50 wt % of Ru oxide."
14	75	Unlike original patent claim 14, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 14, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: first and second pump electrodes comprised of an electrical conducting material permeable to water vapor, separate from said sensing and counter electrodes, and situated on opposite sides of and in contact with said first protonic conductive electrolyte membrane, said second pump electrode being situated on the same side of said first protonic conductive membrane as the counter electrode and having a surface thereon exposed to the water vapor in said means for exposing a surface of said counter electrode to said water vapor; and means for applying a DC power across the first protonic conductive electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across the first protonic conductive electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
15	75	Unlike original patent claim 15, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 15, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of carbon."
16	75	Unlike original patent claim 16, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 16, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of noble metals."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
17	75	Unlike original patent claim 17, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 17, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of the first and second pump electrodes is substantially composed of conductive hydrated metal oxides."
18	75	Unlike original patent claim 18, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 18, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second pump electrodes is comprised of a film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
19	75	Unlike original patent claim 19, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 19, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrical conducting material of said first and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."
20	75	Unlike original patent claim 20, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 20, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for both the first and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
21	75	Unlike original patent claim 21, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 21, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the first pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the first pump electrode is 1 to 50 wt % of platinum."
22	75	Unlike original patent claim 22, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 22, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for the second pump electrode is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for the second pump electrode is 1 to 50 wt % of Ru oxide."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
23	75	Unlike original patent claim 23, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 23, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the electrochemical gas sensor further comprises: a second protonic conductive electrolyte membrane permeable to water vapor; first and second pump electrodes permeable to water vapor and comprised of an electron conductive material, and being separate from said sensing and counter electrodes and situated on opposite sides of and in contact with said second protonic conductive electrolyte membrane, said means for exposing a surface of said counter electrode to said water vapor exposing a surface of said second pump electrode to said water vapor, and said first pump electrode having a surface exposed to the ambient atmosphere; and means for applying a DC power across said second protonic electrolyte membrane, said first and second pump electrodes having in electrical connection therebetween said means for applying DC power across said second protonic electrolyte membrane; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power to the first and second pump electrodes."
24	75	Unlike original patent claim 24, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 24, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is substantially composed of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
25	75	Unlike original patent claim 25, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 25, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the second protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."
26	75	Unlike original patent claim 26, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 26, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface area of the surface of said first pump electrode that is exposed to the ambient atmosphere is smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, whereby the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
27	75	Unlike original patent claim 27, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 27, presented reissue claim 75 does not recite the language "quantitative measurement," and also doe snot recite the language "wherein the surface area of the surface of the second pump electrode that is exposed to said water vapor is separated from said means for exposing a surface of said counter electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
28	75	Unlike original patent claim 28, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 28, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "further comprising: means for applying a DC pulse power source across the first protonic conductive membrane, said sensing and counter electrodes having in electrical connection therebetween said means for applying DC pulse power across the first protonic conductive membrane; and switch means for alternating the connection between the sensing and counter electrodes from the electrical measurement means to the DC pulse power means; whereby, in a positive ambient atmosphere concentration of said gas, said electrical measurement means detects changes in said electrical characteristic when said switch means connects said electrical measurement means to the sensing and counter electrodes; and whereby said DC pulse power means moves the gas away from a side of the gas sensor where the counter electrode is placed when said switch means connects said DC pulse power means to the sensing and counter electrodes."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
29	75	Unlike original patent claim 29, presented reissue claim 75 recites the language “a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere,” also recites the language “said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage,” and also recites the language “the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.” Unlike original patent claim 29, presented reissue claim 75 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the gas is CO.”
30	75	Unlike original patent claim 30, presented reissue claim 75 recites the language “a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere,” also recites the language “said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage,” and also recites the language “the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.” Unlike original patent claim 30, presented reissue claim 75 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the gas is NO_x.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
31	75	Unlike original patent claim 31, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 31, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is hydrogen."
32	75	Unlike original patent claim 32, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 32, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is H_2S."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
33	75	Unlike original patent claim 33, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 33, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is H_2O vapor."
34	75	Unlike original patent claim 34, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 34, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the gas is alcohol vapor."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
35	75	Unlike original patent claim 35, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 35, presented reissue claim 75 does not recite the language "quantitative measurement," does not recite the language "a second protonic conductive electrolyte membrane permeable to water vapor;" does not recite the language "and said first pump electrode having a surface exposed to the ambient atmosphere, said second pump electrode being separated from said counter electrode by said means for exposing a surface of said second pump electrode to said water vapor, and said counter electrode having a surface exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor," and also does not recite the language "means for applying a DC power across said second protonic electrolyte membrane in electrical contact with said first and second pump electrodes; whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said second protonic electrolyte membrane."
36	75	Unlike original patent claim 36, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 36, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of said first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
37	75	Unlike original patent claim 37, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 37, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductor electrolyte membrane."
38	75	Unlike original patent claim 38, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 38, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface of said first pump electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the second pump electrode that is exposed to said water vapor, and wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere, the second protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said second pump electrode that is exposed to said water vapor to the surface of said first pump electrode that is exposed to the ambient atmosphere."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
39	75	Unlike original patent claim 39, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 39, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface area of each of the surfaces of the second pump and counter electrodes that are exposed to said water vapor by said means for exposing a surface of said second pump electrode to said water vapor are each separated from said means for exposing a surface of said second pump electrode to said water vapor by a hydrophobic membrane permeable to water vapor and substantially impervious to water."
40	75	Unlike original patent claim 40, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 40, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein said means for exposing a surface of said second pump electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
41	75	Unlike original patent claim 41, presented reissue claim 75 recites the language “a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere,” also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material,” also recites the language “said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage,” and also recites the language “the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.” Unlike original patent claim 41, presented reissue claim 75 does not recite the language “quantitative measurement,” and also does not recite the language “wherein at least one of the surfaces of said first protonic conductive electrolyte membrane in contact with one of the sensing and counter electrodes is substantially nonplanar, and wherein at least one of the surfaces of said second protonic conductive electrolyte membrane in contact with one of the first and second pump electrodes is substantially nonplanar.”
42	75	Unlike original patent claim 42, presented reissue claim 75 recites the language “a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere,” also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material,” also recites the language “said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage,” and also recites the language “the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.” Unlike original patent claim 42, presented reissue claim 75 does not recite the language “quantitative measurement,” and also does not recite the language “wherein at least one of the sensing, counter, first pump, and second pump electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
43	75	Unlike original patent claim 43, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 43, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the film is substantially composed of a noble metal."
44	75	Unlike original patent claim 44, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 44, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
45	75	Unlike original patent claim 45, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 45, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the at least one of the sensing, counter, first pump, and second pump electrodes is substantially comprised of proton conductive material."
46	75	Unlike original patent claim 46, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 46, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the first and second protonic conductive electrolyte membranes is substantially comprised of a solid, perfluorinated, ion-exchange polymer."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
47	75	Unlike original patent claim 47, presented reissue claim 75 recites the language “a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere,” also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material,” also recites the language “said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage,” and also recites the language “the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.” Unlike original patent claim 47, presented reissue claim 75 does not recite the language “quantitative measurement,” and also does not recite the language “wherein at least one of the first and second protonic conductive electrolyte membranes is a hydrated metal oxide protonic conductive electrolyte membrane.”
48	75	Unlike original patent claim 48, presented reissue claim 75 recites the language “a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere,” also recites the language “wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material,” also recites the language “said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage,” and also recites the language “the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode.” Unlike original patent claim 48, presented reissue claim 75 does not recite the language “quantitative measurement,” and also does not recite the language “wherein the electrical conducting material of at least one of said sensing, counter, first pump, and second pump electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material.”

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
49	75	Unlike original patent claim 49, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 49, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, first pump, and second pump electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
50	75	Unlike original patent claim 50, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 50, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump and second pump electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
51	75	Unlike original patent claim 51, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 51, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
52	75	Unlike original patent claim 52, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 52, presented reissue claim 75 does not recite the language "quantitative measurement," and does not recite the language "a reference electrode permeable to water vapor and comprised of an electrical conducting material; a counter electrode permeable to water vapor and comprised of an electrical conducting material and being separate from both said sensing and reference electrodes, and being exposed to the ambient atmosphere; a protonic conductive electrolyte membrane permeable to water vapor, having top and bottom sides, said bottom side of said protonic conductive membrane being in contact with the counter electrode, and the top side of said protonic conductive membrane being in contact with the sensing and reference electrodes;" and also does not recite the language "wherein the electrical conducting material of at least one of said sensing, counter, and reference electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
53	75	Unlike original patent claim 53, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 53, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "further comprising: means for applying a DC power across said protonic electrolyte membrane in electrical contact between the sensing electrode and said counter electrode, whereby the gas is transported away from the counter electrode when the DC power means applies a DC power across said protonic electrolyte membrane."
54	75	Unlike original patent claim 54, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 54, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein said means for exposing a surface of said counter electrode to said water vapor further contains an antifreeze additive."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
55	75	Unlike original patent claim 55, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 55, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the surface of said sensing electrode that is exposed to the ambient atmosphere has a surface area smaller than the surface area of the surface of the counter electrode that is exposed to said water vapor, whereby the first protonic conductive electrolyte membrane is exposed to substantially 100 percent relative humidity, and a positive pressure of said water vapor exists from the surface of said counter electrode that is exposed to said water vapor to the surface of said sensing electrode that is exposed to the ambient atmosphere."
56	75	Unlike original patent claim 56, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 56, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the surfaces of said protonic conductive electrolyte membrane in contact with one of the sensing, counter, and reference electrodes is substantially nonplanar."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
57	75	Unlike original patent claim 57, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 57, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, first pump, and second pump electrodes is about 1-50 wt % of Ru oxide."
58	75	Unlike original patent claim 58, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 58, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein at least one of the sensing, counter, and reference electrodes is comprised of film having a thickness in the range of about 50 Angstroms to 10,000 Angstroms."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
59	75	Unlike original patent claim 59, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 59, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the film is substantially composed of a noble metal."
60	75	Unlike original patent claim 60, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 60, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the noble metal is platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
61	75	Unlike original patent claim 61, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 61, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is substantially comprised of a solid, perfluorinated, ion-exchange polymer."
62	75	Unlike original patent claim 62, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 62, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the protonic conductive electrolyte membrane is a hydrated metal oxide protonic conductor electrolyte membrane."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
63	75	Unlike original patent claim 63, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 63, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein the proton conductor material for said at least one of the sensing, counter, and reference electrodes is a copolymer having a tetrafluoroethylene backbone with a side chain of perfluorinated monomers containing at least one of a sulfonic acid group or a carboxylic acid group."
64	75	Unlike original patent claim 64, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 64, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of platinum."

Original Patent Claim	Presented Reissue Claim	Differences in Claim Language
65	75	Unlike original patent claim 65, presented reissue claim 75 recites the language "a non-biased electrochemical gas sensor for measurement of a gas in an ambient atmosphere," also recites the language "wherein the electrical conducting material of at least one of said sensing and counter electrodes is a proton-electron mixed conductive material having 10-50 wt % of a proton conductor material and 50-90 wt % of a first and a second electrical conductor material," also recites the language "said electrical measurement means detects changes in said electrical characteristic in the absence of any biasing voltage," and also recites the language "the sensing electrode reacts with the gas to produce a change in electrical characteristic between the sensing electrode and the counter electrode in the absence of an applied voltage to the sensing electrode." Unlike original patent claim 65, presented reissue claim 75 does not recite the language "quantitative measurement," and also does not recite the language "wherein one of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 50-99 wt % of carbon black, and the other of the first and second electrical conductor materials for said at least one of the sensing, counter, and reference electrodes is about 1-50 wt % of Ru oxide."